

MILKEN INSTITUTE SCHOOL OF PUBLIC HEALTH

# RESEARCH DAY 2025

Abstract Booklet

April 16, 2025







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## Message from the Dean



Dear GWSPH Community,

Welcome to the 28th Annual Research Day at the Milken Institute School of Public Health (Milken Institute SPH). Today, we celebrate the spirit of inquiry, the pursuit of innovation, and the power of collaboration that define our school. Research Day is one of my favorite annual events because it highlights the dedication of our students and the invaluable mentorship that nurtures their development into the next generation of public health leaders. This event offers an invaluable opportunity to develop and showcase skills that extend far beyond academia—effective communication, the art of storytelling, and building connections with diverse audiences.

Our commitment to research excellence is a cornerstone of the Milken Institute SPH. From groundbreaking studies to creative solutions addressing global and local challenges, our students and faculty are at the forefront of advancing public health. With access to cutting-edge tools, interdisciplinary partnerships, and a community of thought leaders, we continue to set the standard for transformative education and impactful discoveries.

To our students, thank you for your bold ideas and hard work, which inspire us all. Your research is not just about generating knowledge; it's about making a difference in the lives of individuals and communities.

To our mentors, faculty, and staff, your guidance and support are the foundation of our students' success, and we are deeply grateful for your dedication.

I encourage everyone attending to explore the extraordinary presentations, engage with our talented students, and celebrate the vibrant intellectual community that makes the Milken Institute SPH unique. Together, we are celebrating the future of public health.

Thank you for being a vital part of this journey.

Warm regards,

**Lynn R. Goldman, MD, MS, MPH**

Michael and Lori Milken Dean

Milken Institute School of Public Health

The George Washington University



## Message from Senior Associate Dean for Research and Innovation



Dear Guests and members of the GW community,

Welcome to the GW Milken Institute School of Public Health's Research Day 2025! I am delighted to co-host this event on behalf of the school and would like to commend our faculty, staff, and students for their outstanding research efforts over the past year and the inspiring work on display today.

First and foremost, I would like to extend my heartfelt thanks to the Office of Research Excellence team (coordinated by Imomotimi and Tien-Chin) and all the staff and volunteers who contributed to making the Milken Institute School of Public Health Research Day 2025 a great success. This event is a testament to their hard work and dedication and would not be possible without their efforts.

In our ever-changing world, the importance of public health has become increasingly clear, and the Milken Institute School of Public Health has emerged as a distinct leader in the field. Through groundbreaking research and unwavering dedication to mission and ideals, this community is driving key advancements and new discoveries that will continue to address and combat the most pressing issues our world faces today. This mission and work is even more important in the contemporary context we operate, and the leadership of science, inquiry and research is much needed.

Today's event is an excellent opportunity for attendees to exchange knowledge, keep up with the latest breakthroughs, participate in dynamic discussions, and build valuable connections and collaborations. The research presented here covers a wide range of topics, ranging from epidemiological studies, to laboratory sciences and field trials.

Finally, I want to express my sincere appreciation to all the presenters, judges, sponsors, organizers, and attendees for their unrelenting dedication to seeking knowledge and promoting public health research. This event shows the best parts of our community and demonstrates our shared goals to work tirelessly towards building a more equitable and healthier world for everyone. It is our hope that the work and relationships fostered today will serve as a building block as together we continue to work for a better tomorrow.

Sincerely,

**Adnan A. Hyder, MD, MPH, PhD**

Senior Associate Dean for Research and Innovation  
Professor of Global Health



## Welcome from GWSPH Leaders



We are delighted to welcome you to GW Milken Institute School of Public Health's Research Day 2025! This event is a celebration of the outstanding research and scholarly contributions of our exceptional students, staff, and faculty. It also highlights the collaborative, interdisciplinary, and innovative spirit that defines the GWSPH experience—an essential force in addressing the complex public health challenges we face both nationally and globally.

The Offices of Academic Affairs, Student Affairs, and Faculty Affairs are proud to support and advance these impactful research efforts. We are committed to fostering an inclusive and dynamic environment where students, faculty, and staff are empowered to think critically, explore interdisciplinary approaches, and develop innovative solutions for a healthier world.

We encourage you to take full advantage of today's opportunities to learn, engage, and collaborate. The diverse array of research topics and presentations showcases the dedication and ingenuity of our community in advancing public health. To all participants, we wish you success in your research and academic pursuits—your work is shaping the future of public health.

Enjoy the day, and let's continue driving meaningful change together!

Sincerely,

**Jane Hyatt Thorpe, JD**

Sr. Associate Dean for Academic, Student and Faculty Affairs  
Professor, Department of Health Policy and Management

**Heather Renault**

Assistant Dean for Student Services

**Monica Partsch**

Assistant Dean for Faculty Affairs





## Welcome from Associate Deans



Dear guests and members of the GW community,

On behalf of the Office of PhD/MS programs, we welcome you to Research Day 2025. We are thrilled that so many of our students are participating. Research Day is an incredible opportunity to share with other students and faculty the exciting work that we engage in throughout the year. It offers a time to step back, reflect on progress and interact with others regarding our findings and their implications. Above all, it is a time to enjoy that we are a community devoted to the systematic pursuit of new knowledge to improve public health. Thank you to the students who worked so hard to prepare their work for

dissemination and to the faculty and research mentors that continue to support them. Best wishes for a successful and informative research day!

### **Heather A. Young, PhD, MPH**

Associate Dean for PhD/MS Programs  
Professor/Vice Chair of Epidemiology



Dear GWSPH Community,

Welcome to the GW Milken Institute School of Public Health Research Day! Here, we celebrate innovative research produced by undergraduate and graduate students, faculty, staff, and the community. From COVID-19 to childhood obesity, public health researchers respond to today's greatest challenges.

Our undergraduate students are drawn to GWSPH because of our outstanding faculty, extensive public health programs, and location in Washington, D.C. They work on cutting-edge research and participate in Research Day to hone their skills and prepare for public health careers.

Thank you to the staff and volunteers who made this event possible. Enjoy the GW Milken Institute School of Public Health Research Day!

### **Sara E. Wilensky, JD, PhD**

Associate Dean for Undergraduate Education  
Associate Teaching Professor, Department of Health Policy and Management



## Welcome from Office of Applied Public Health



Dear GWSPH Community, Friends, and Leaders:

Welcome to Research Day!

On behalf of the Office of Applied Public Health (OAPH) and our Doctor of Public Health (DrPH) Program, I am honored to welcome you to this important event. Research Day is a celebration of innovation, discovery, and the critical role of applied research in shaping the future of public health.

The translation of research into practice is essential in improving health outcomes worldwide. From saving lives and controlling infectious and chronic diseases to addressing the social, political, and commercial determinants of health, evidence-based solutions drive meaningful change. Today, we recognize and celebrate the dedication of researchers who are committed to bridging the gap between science and real-world impact.

I extend my deepest gratitude to all participants who have contributed their insights, expertise, and groundbreaking research. Your work not only inspires but also paves the way for a healthier, more equitable world. May this event serve as a platform for collaboration, learning, and innovation as we continue to push the boundaries of public health excellence.

To all of our presenters – thank you for your work. I look forward to an enriching and inspiring Research Day!

**Gene Migliaccio, DrPH, MPH**

Associate Dean of Applied Public Health

Professor of Global Health

Director, Doctor of Public Health Program





## Welcome from Research Committee



Dear Colleagues,

Amidst today's challenges in the field of public health, I am excited to welcome you to the 2025 Research Day at the GW Milken Institute School of Public Health! As in past years, this annual event facilitates our school community coming together to learn from one of our most valuable school assets – the students.

Students showcasing their work today represent many different academic departments and programs and include those pursuing undergraduate, masters, doctoral and postdoctoral studies. The diversity of research is one of the most notable features of the work presented today. Projects presented encompass basic and applied public health research and provide insights into myriad topics addressing public health in domestic and international settings.

One of the most satisfying aspects of Research Day is our ability to see through the presentations how GWSPH students have gained skills in rigorous research methods, communicating and translating research findings for diverse audiences, and applying innovative ideas to address pressing public health issues. Also on display is evidence of the collaborations that our students develop within and across academic departments and the university and in partnership with communities outside of the university.

By presenting or attending Research Day, it is our hope that you will walk away with new understandings and inspiration for advancing your own public health research and practice. Research Day 2025 demonstrates our school's commitment to science during a time of meaningful change and challenge facing the field of public health.

In closing, I wish to extend a heartfelt thank you to everyone who has contributed their time and energy in the form of developing research projects and presentations and contributing to the review of this year's submissions for Research Day.

**Kathleen M. Roche, PhD**

Professor, Prevention & Community Health  
Chair, SPH Research Committee



## Welcome from Lab PI Committee



Dear GWSPH Community,

Scientific discovery is the backbone of public health, in the field, policy-making space, and in the lab. This research plays a vital role in shaping the future of global health. As new threats emerge and evolve, the foundation of our public health advancements frequently begins at the bench.

From identifying emerging diseases to the development of innovative diagnostic tools and understanding of mechanisms of disease, laboratory research provides critical insights that inform evidence-based interventions and public health strategies. Through the synergy of lab science, real-world implementation, and policy innovation, we create sustainable solutions to today's most pressing health challenges.

As we gather for Research Day 2025, I encourage you to celebrate the diversity of research represented here today and recognize the interconnectedness of our work. Every experiment, dataset, and analysis brings us one step closer to a healthier, more equitable world. On behalf of the School of Public Health's laboratory faculty and staff, thank you for joining us and for your continued dedication to discovery.

**Matthew Barberio, PhD**

Lab PI Committee Chair

Assistant Professor of Exercise and Nutrition Sciences

**Jack Villani, MSc**

Public Health Laboratory Manager



# Welcome from Centers and Institutes

## Center for Health and Health Care in Schools



I am excited to have the Center for Health and Health Care in Schools (CHHCS) at GW join all of you at the Milken Institute School of Public Health Research Day 2025!

For the first time, CHHCS is sponsoring a prize to recognize and celebrate research conducted by graduate and doctoral students that focuses on school-connected strategies, programs, or approaches that improve health and education outcomes for PreK-12 children and their families. CHHCS has long championed the integration of best practices in public health, behavioral health, and education that meaningfully involve community partnerships in all

phases of the research endeavor.

We know that studies using participatory approaches to address important community-based issues can catalyze program, practice, and policy improvements across systems.

We look forward to learning about the amazing research conducted and how we can apply that new knowledge to benefit our families and communities.

Thanks to all those who made this event possible. Enjoy Public Health Research Day!

### **Olga Acosta Price, PhD**

Associate Professor, Department of Prevention and Community Health  
Director, Center for Health and Health Care in Schools



## Climate and Health Institute and REACH Center



Dear GWSPH Community,

The GW Climate and Health Institute (CHI) and the Research and Engagement for Action on Climate and Health (REACH) Center are thrilled to sponsor two awards, one in partnership with the GW Center for Excellence in Maternal and Child Health, at the 2025 Milken Institute School of Public Health Research Day! This event provides an incredible platform to celebrate innovative research and recognize outstanding contributions that drive meaningful change in our communities. We are excited to support researchers dedicated to addressing some of the most pressing challenges at the intersection of

climate and health, and we look forward to engaging with the brilliant minds pushing the boundaries of discovery and application in this critical field.

Sincerely,

**Susan Anenberg, PhD**

Professor and Chair, Department of Environmental and Occupational Health  
Director, GW Climate and Health Institute

## Global Food Institute



To the GWSPH Community,

The Global Food Institute is thrilled to participate in this year's Research Day. Equitable access to affordable and healthy food is a critical factor in overall health and wellbeing and a key focus of GFI's work. I applaud the public health students and faculty who are advancing innovative and impactful research in this area. GFI looks forward to seeing how GWSPH's researchers continue to build on knowledge and collaborate with their peers to change the world through the power of food.

Have a wonderful Research Day!

**William H. Dietz, MD, PhD**

Director of Research and Policy, The Global Food Institute  
Director, STOP Obesity Alliance  
Professor, Department of Exercise and Nutritional Sciences



## Computational Biology Institute and Genomics Core



Bioinformatics and genomics play pivotal roles in advancing public health by enabling the analysis and interpretation of vast amounts of biological, environmental and clinical data to improve disease prevention, diagnosis, and treatment. Through the integration of computational tools and genomic technologies, researchers can identify genetic markers associated with diseases, track the spread of infectious pathogens, and understand the molecular basis of complex conditions. For instance, genomic sequencing of viruses like SARS-CoV-2 has been instrumental in monitoring viral evolution and guiding vaccine development during the COVID-19 pandemic.

Bioinformatics also facilitates personalized medicine by analyzing individual genetic profiles to tailor treatments, such as identifying targeted therapies for cancer patients. Additionally, large-scale genomic studies help uncover population-level health trends, informing public health policies and interventions. By bridging the gap between biological data and actionable insights, bioinformatics and genomics empower healthcare systems and public health practitioners to address global health challenges more effectively. As Director of both the [GW Genomics Core](#) and the [Computational Biology Institute](#), it is my pleasure to welcome you to the GW Milken Institute School of Public Health Research Day. I encourage you to especially keep an eye out for exciting research in bioinformatics and genomics!

### Keith A. Crandall, PhD

Founding Director, Computational Biology Institute  
Founding Director, GW Genomics Core  
Professor, Department of Biostatistics and Bioinformatics

## Fitzhugh Mullan Institute for Health Workforce Equity



On behalf of the Fitzhugh Mullan Institute for Health Workforce Equity, we are pleased to welcome you to Research Day 2025. We are excited to see the vibrant participation of so many students, as this event provides a unique platform to showcase the innovative work being carried out throughout the year. Research Day offers an invaluable opportunity to pause, reflect on the progress made, and engage in meaningful discussions about the ideas driving our efforts and the importance of our findings. Above all, it is a time to celebrate our collective commitment to advancing health equity through the rigorous pursuit of knowledge. We hope you have a rewarding and inspiring Research Day!

### Patricia Pittman, PhD

Professor, Department of Health Policy and Management  
Director, Fitzhugh Mullan Institute for Health Workforce Equity





## Global Women's Institute



Dear GW Community,

Welcome to the GW Milken Institute School of Public Health Research Day 2025! At the Global Women's Institute, we are excited to be part of another Research Day and to have the opportunity to learn about the innovating work of students at GWMISPH.

Research Day gives our students the opportunity to explore another key component of public health research: Sharing your findings in a way that is powerful, concise, and understandable by a diverse audience. As faculty and staff who participate in this event, it is our job to encourage our students and give them meaningful feedback as they learn how to present their research findings and how to articulate what their findings might mean for the wellbeing of our community, both here at GW and beyond.

Our work at the Global Women's Institute similarly depends on our capacity to translate research into digestible presentations and briefs for a variety of stakeholders, and we love that Research Day gives us an opportunity each year to watch our own students develop this skillset in real-time.

While each of the projects featured in this year's Research Day is, on its own, deserving of recognition, it is really the cumulative total of all of the research projects that is equally worth celebrating: the hard work and dedication of the students, the encouragement and support they received from their faculty mentors, and the passion of everyone involved in Research Day, including those behind the scenes, who continue to make Research Day a reality each year.

We look forward to meeting and engaging with everyone who is participating in Research Day 2025. And we wish all of those who are participating this year, good luck!

**Mary Ellsberg**

Executive Director, Global Women's Institute





## GW Center of Excellence in Maternal and Child Health



Dear GWSPH Community,

It is with immense joy that we welcome you to the Milken Institute School of Public Health Research Day 2025. On behalf of the GW Center of Excellence in Maternal and Child Health (MCH), we are honored to sponsor two research awards this year, celebrating the remarkable dedication and innovative spirit of our student scholars.

Our Center is committed to nurturing new talent and fostering the growth of public health professionals. Our vision extends beyond education to impactful action, aiming to significantly enhance health outcomes for women, children, and youth throughout their lives. Today, as you peruse the posters and listen to students presenting the results of their research, you'll see that the future of public health is in good hands.

Research Day is a vital celebration of our academic community's strength and shared purpose. It enhances our sense of community and commitment, serving as a powerful reminder of the collective goals we strive to achieve. In these times, when challenges are complex, the need for innovative and bold ideas in public health has never been greater. Today, you will sense a promising future in public health—a future shaped by brilliant and passionate students.

We are inspired by the dedication of our undergraduate, graduate, and doctoral students. Their work is not just academic; it is a quest for knowledge aimed at improving the lives of women, children, families, and communities. May their research energize our commitment and remind us of the significant change we can create together.

With warm regards,

**Amita Vyas, PhD, MHS**

Professor & Director, GW Center of Excellence in Maternal and Child Health

**Jerry Franz**

Academic Adviser & Associate Director, GW Center of Excellence in Maternal and Child Health



## Institute for Racial, Ethnic, and Socioeconomic Equity



Dear GWSPH Community and Friends,

Welcome to the GW Milken Institute School of Public Health Research Day 2025! The achievement of public health demands systems and policies that proactively remove barriers and foster opportunity for all. When these structures promote/advance fair access to essential resources, we move toward a society where health is determined not by race, income, or zip code, but by our collective commitment to health and well-being.

Today, we celebrate the innovative research of our GW community—work that deepens our understanding of the social, economic, and environmental factors shaping health outcomes and drives action toward meaningful change. At the Institute for Racial, Ethnic, and Socioeconomic Equity, we don't just examine disparities—we drive solutions. That is why we are proud to sponsor six of today's research awards, recognizing projects that move beyond identifying challenges to designing tangible, community-driven solutions that reshape systems and advance equity.

I encourage you to take full advantage of this opportunity to engage with new ideas, connect with fellow researchers across departments and disciplines, and be inspired by the breadth of work presented today. Congratulations to all participants—your work fuels the future of public health. Your dedication moves us closer to a world where health equity is more than an aspiration, but a reality.

**Wendy Ellis, DrPH, MPH**

Director, Institute for Racial, Ethnic, and Socioeconomic Equity



## Program

**GWSPH Research Day**  
**April 16, 2025**  
**The Convening Center**  
**Milken Institute School of Public Health**

7:00 am - 11:00 am	Poster Presentation Setup
11:00 am - 12:00 pm	Judges Arrival
12:00 pm - 4:00 pm	Judging of Posters and Posters Viewing
12:00 pm - 3:00 pm	<a href="#">Research Center/Institute</a> Showcase
12:00 pm - 3:00 pm	GWSPH Research Support Team Engagement
2:00 pm - 3:00 pm	Light Refreshments and Networking Event
3:00 pm - 4:00 pm	Awards and Prizes Ceremony
4:00 pm - 4:30 pm	Poster Removal and Picture Event

## Abstracts by Department

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# Biostatistics and Bioinformatics

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# **GWSPH RESEARCH SHOWCASE**

# **BIOSTATISTICS AND**

# **BIOINFORMATICS**

## **seqLens: optimizing language models for genomic predictions**

Understanding genomic sequences through the lens of language modeling has the potential to revolutionize biological research, yet challenges in tokenization, model architecture, and adaptation to diverse genomic contexts remain. In this study, we investigated key innovations in DNA sequence modeling, treating DNA as a language and applying language models to genomic data. We gathered two diverse pretraining datasets: one consisting of 19,551 reference genomes, including over 18,000 prokaryotic genomes (115B nucleotides), and another more balanced dataset with 1,354 genomes, including 1,166 prokaryotic and 188 eukaryotic reference genomes (180B nucleotides). We trained five byte-pair encoding tokenizers and pretrained 52 DNA language models, systematically comparing different architectures, hyperparameters, and classification heads. We introduce seqLens, a family of models based on disentangled attention with relative positional encoding, which outperforms state-of-the-art models in 13 of 19 benchmarking phenotypic predictions. We further explore continual pretraining, domain adaptation, and parameter-efficient fine-tuning methods to assess trade-offs between computational efficiency and accuracy. Our findings demonstrate that relevant pretraining data significantly boosts performance, alternative pooling techniques enhance classification, and larger tokenizers negatively impact generalization. These insights provide a foundation for optimizing DNA language models and improving genome annotations.

## **Primary Presenter**

Mahdi Baghbanzadeh

## **Co-Presenter(s)**

N/A

## **Status**

Doctoral

## **Authors**

Brendan Mann

Keith A. Crandall

Ali Rahnavard

## **Research Mentor/ Department Chair**

Ali Rahnavard



# GWSPH RESEARCH SHOWCASE

# BIostatISTICS AND

# BIOinformatics

## Addressing missingness in injury history data using multiple imputation

**Background:** Sports injury surveillance is a powerful tool for characterizing the epidemiology of sport injuries. However, missing data on key variable such as injury history can limit the ability to accurately classify injury events and understand epidemiological features. In this study, we examined the implications of missingness in injury history data and evaluated approaches for handling such missingness.

**Methods:** We examined a common surveillance-based analytic scenario in which the outcome of interest was injury recurrence, and the objective was to identify determinants associated with an injury event being classified as recurrent. Injury data were drawn from the National Collegiate Athletic Association Injury Surveillance Program and included lateral ankle sprain cases reported in men's and women's soccer during the 2014/15–2018/19 academic years. A logistic regression framework was used to evaluate associations between selected covariates and the classification of an injury as recurrent. We systematically assessed missingness in injury history data by implementing a multiple imputation strategy using R package mice. Each imputed dataset was analyzed using a logistic regression model to identify covariate predictors of the odds of a recurrent injury classification. Final estimates were obtained by pooling estimates across imputed datasets using Rubin's Rule. For comparison, another model was fit using records with only complete cases of injury history and covariate data using listwise deletion. Effect estimates and 95% CIs from both models (imputed and complete-cases) were used to assess the effect of missingness on inferences.

**Results:** Overall, 14.9% of  $n = 589$  records were missing injury history information. We observed a greater proportion of missing cases in women's- (15.5%) vs. men's-soccer (14.2%). Using only cases with complete injury history data, injury mechanism emerged as the sole significant predictor of a recurrent injury classification, with odds of an injury being classified as recurrent lower in contact vs. non-contact injuries ( $OR_{adj} = 0.27$ ; 95% CI = [0.15, 0.48]). A similar result was observed following multiple imputation, with the pooled estimates also indicating lower odds of an injury being classified as recurrent in contact vs. non-contact injuries ( $OR_{adj} = 0.25$ ; 95% CI = [0.15, 0.43])

**Conclusion:** Our analyses suggest that this missingness in injury history may be characterized as either missing completely at random or missing at random in this case. Furthermore, multiple imputation was an effective strategy for addressing missingness in similar analyses involving injury history.

## Primary Presenter

Aishwarya Bandaru

## Co-Presenter(s)

## Status

Masters

## Authors

Aishwarya Bandaru

Neel Rao

Adrian Boltz

Kody Campbell

Avinash Chandran

Angelo Elmi

## Research Mentor/ Department Chair

Avinash Chandran

Angelo Elmi

# GWSPH RESEARCH SHOWCASE

# BIOSTATISTICS AND

# BIOINFORMATICS

## *cellSight*: Enhanced Single-Cell Analysis Platform and Comprehensive Cell Communication

**Background:** The rapid advances in sequencing technology have revolutionized transcriptomics with single-cell RNA sequencing (scRNA-seq), illuminating cellular biology at an unprecedented level. However, scRNA-seq's complexity nature leads to research workflows with analysis-stage bottlenecks. We introduce *cellSight*, an end-to-end, automated R package that enables efficient scRNA-seq analysis, from quality control to differential expression. Our pipeline is novel by integrating spatial transcriptomics with Graph Attention Networks (GAT) to make more robust ligand-receptor interaction prediction with spatial context. Our approach offers richer tissue microenvironment and intercellular communication network insights by considering expression patterns and cell spatial organization.

**Methods:** *cellSight* provides a comprehensive framework for scRNA-seq analysis, from rigorous quality control to advanced differential expression profiling. The pipeline employs strict filtering based on mitochondrial content and UMI counts before applying sctransform normalization to address technical noise and biological variability. For differential expression analysis, *cellSight* leverages the Tweedieverse statistical framework, which handles zero-inflated data effectively using Tweedie compound Poisson distributions. Our pipeline extends beyond conventional analysis by integrating spatial transcriptomics data through Graph Attention Networks (GAT). This novel approach enhances the existing CellChat functionality by incorporating spatial context into ligand-receptor interaction predictions. GAT's attention mechanism assigns different weights to neighboring cells based on their spatial proximity and expression patterns, allowing for more accurate modeling of intercellular communication. By considering both topological features and spatial organization, *cellSight* can detect communication patterns influenced by tissue architecture by incorporating spatial relationships, a critical advance over traditional methods.

**Results:** In our case study, *cellSight* efficiently identified 21 distinct cell clusters from injured murine skin tissue while significantly reducing computational overhead by 40%. In the skin aging study, our pipeline revealed previously undetected age-related changes in fibroblast communication networks across varied celltypes. Our GAT-enhanced approach for ligand-receptor prediction demonstrated superior performance, achieving 86% accuracy compared to 75% with traditional spatial transcriptomic methods, particularly in detecting context-dependent interactions.

**Conclusion:** *cellSight* demonstrates substantial improvements in computational efficiency and analytical accuracy for scRNA-seq data processing. By integrating spatial transcriptomics with Graph Attention Networks, our pipeline achieves an 11% increase in ligand-receptor prediction accuracy compared to traditional methods. This advancement enables more precise mapping of context-dependent cellular communications.

## Primary Presenter

Ranojoy Chatterjee

## Status

Doctoral

## Authors

Chirrag Gohel

Ishita Chopra

Breet A. Shook

Ali Rahnavard

## Research Mentor/ Department Chair

Ali Rahnavard

# GWSPH RESEARCH SHOWCASE

# BIostatISTICS AND

# BIOINFORMATICS

## Primary Presenter

Ishita Chopra

## Characterizing Cell Interaction and Gene Expression

**Background:** Skin biology varies significantly among racial groups, affecting disease susceptibility, wound healing, and treatment responses. Despite clinical evidence of these differences, their cellular and molecular bases remain poorly understood. Fibroblasts, crucial for extracellular matrix production and tissue repair, contribute to these varied skin-type variations in skin physiology

**Research Purpose:** Our study aimed to characterize fibroblast heterogeneity in cell interactions, their gene expression, and backgrounds, as well as to identify race-specific gene expression patterns that may explain clinical differences in skin biology. We hypothesized that distinct fibroblast subpopulations and their transcriptional profiles would differ between African American and Caucasian skin.

**Methods:** We performed single-cell RNA sequencing *cellSight* pipeline on skin samples from African American (n=5) and Caucasian (n=1) individuals. Following quality control, 14,046 cells were analyzed using the *cellSight* pipeline in R. The 6 datasets were integrated into once concise data based on anchor genes. The integrated dataset was clustered using the Louvain algorithm which yielded 24, and visualized with UMAP plots. Differential gene expression analysis was conducted using Tweedie verse, which employs compound poisson model to unearth differentially expressed genes between the condition. Finally, using *cellSight*, we investigated the intercellular communication between our targeted fibroblast cell type.

**Results & Conclusions:** We identified seven distinct fibroblast subclusters (FB1-FB7) characterized by unique gene signatures. African American skin demonstrated a significant enrichment of FB1 fibroblasts (34% compared to 22% in Caucasian skin,  $p < 0.05$ ), while Caucasian skin exhibited a higher prevalence of SFRP2-expressing FB3 fibroblasts (14% versus 8%,  $p < 0.05$ ). Analysis identified 87 differentially expressed genes between racial groups, with HLA-C being significantly upregulated in African American fibroblasts ( $FDR = 3.341e-128$ ) and KRTDAP elevated in Caucasian fibroblasts ( $FDR = 3.205e-101$ ). Notably, 63% of these differential expressions were concentrated within the FB1 subpopulation.

**Conclusion:** These findings provide novel insights into skin type specific fibroblast biology that may explain observed differences in wound healing, scarring tendencies, and disease susceptibility. In African American skin-type, suggests differences in signaling pathways affecting extracellular matrix production and remodeling, potentially explaining higher keloid prevalence. Conversely, predominance of SFRP2-expressing fibroblasts in Caucasian skin-type may contribute to different tissue repair dynamics. The differential immune-related gene expression suggests race-specific variations in inflammatory responses. These discoveries could inform the development of personalized therapeutic approaches that account for racial differences in skin biology, potentially improving treatment outcomes for various dermatological conditions.

## Status

Masters

## Authors

Ranojoy Chatterjee

Ali Rahnavard(Ph.D)

## Research Mentor/ Department Chair

Ali Rahnavard

# GWSPH RESEARCH SHOWCASE

# BIostatISTICS AND

# BIOinformatics

## Research as a Service, RTS & You

Research Technology Services (RTS) provides a comprehensive research computing and data infrastructure, centered around *Pegasus*, a flagship > 200-node HPC cluster with high-speed Infiniband, heterogeneous compute nodes (CPU, GPU, High Memory, etc), and two 2PB file systems. Supporting clusters include *Cerberus* for teaching, *Raptor* for testing and contingency, and *Viper* for high-throughput and Open Science Grid access.

RTS also manages research storage (NAS), REDCap in AWS, research databases, and federated data sharing via Globus. The research cloud supports specialized, compliant environments like PRISMA, using platforms like Ronin and multi-cloud resources (mostly AWS). Consultancy services include support for GWNIC, data workflows, and program-specific platforms (e.g., GWSPH's Armor & Strongbox, SMHS's HIVE, SEAS's Franklin HPC).

RTS also maintains CAAREN, a high-speed research network interconnecting regional institutions and offering cloud access, Eduroam, InCommon services, and redundancy via Quilt membership.

## Primary Presenter

Joseph Creech

## Co-Presenter(s)

Adam Wong

Dacian Reece-Stremtan

Shashwitha Puttaswamy

Nik Ivanov

## Status

Research Staff

## Authors

Stefan Kozemchak

Marco Suarez

Glen MacLachlan

## Research Mentor/ Department Chair

Clark Gaylord

Rubeel Iqbal

# **GWSPH RESEARCH SHOWCASE**

# **BIOSTATISTICS AND**

# **BIOINFORMATICS**

## **Automated Prior Elicitation from Databases for Bayesian Metabolomics Analysis**

Modern metabolomics experiments generate rich, high-dimensional data that capture complex biochemical relationships. While public databases like KEGG, HMDB, and Reactome contain extensive prior knowledge about metabolic networks, incorporating this information systematically into statistical analyses remains challenging. We present a novel framework for automatically constructing informative prior distributions from metabolic databases for Bayesian analysis of metabolomics data. Our method extracts network topology, reaction directionality, and known concentration ranges to build hierarchical prior distributions that respect biochemical constraints while accounting for database uncertainty. We demonstrate our approach on both targeted and untargeted LC-MS data, showing improved power for differential abundance testing and more biologically plausible pathway-level effect estimates compared to standard methods. This work provides a principled bridge between accumulated biochemical knowledge and modern Bayesian methods for metabolomics.

### **Primary Presenter**

Chiraag Gohel

### **Status**

Doctoral

### **Authors**

Chiraag Gohel

Ali Rahnavard

### **Research Mentor/ Department Chair**

Ali Rahnavard

# GWSPH RESEARCH SHOWCASE

# BIostatistics and

# Bioinformatics

## Transcriptomic Signatures and Functional Pathways in HBV and HCV Infections: A Comparative RNA-seq Analysis Using Dual Quantification Strategies

Chronic infections with Hepatitis B (HBV) and Hepatitis C (HCV) viruses are leading causes of liver disease, yet their impact on the host transcriptome remains incompletely characterized. We conducted a comprehensive RNA-seq analysis of whole blood samples from HBV, HCV, and control groups to identify virus-specific gene expression patterns, immune responses, and functional pathways. Two complementary quantification pipelines—Salmon (transcript-level, alignment-free) and STAR + featureCounts (genome-level, alignment-based)—were employed to ensure robustness and cross-validation.

Quality control and read trimming were followed by genome and transcriptome alignment, quantification, and differential expression analysis using DESeq2. Principal component analysis revealed a clear segregation of HBV-infected samples from HCV and controls. Volcano plots identified distinct sets of differentially expressed genes (DEGs) for each comparison. Functional enrichment using clusterProfiler revealed that HBV-associated DEGs were enriched in immune and inflammatory response pathways, while HCV-associated DEGs overlapped with metabolic and stress-related processes. KEGG pathway analysis further highlighted differences in viral-host interaction and oncogenic signaling.

This study reveals divergent transcriptomic landscapes between HBV and HCV infections and demonstrates the added value of integrating multiple quantification strategies. Our findings provide insights into disease specific mechanisms and potential molecular targets for diagnostic or therapeutic development.

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# GWSPH RESEARCH SHOWCASE

# BIOSTATISTICS AND

# BIOINFORMATICS

## Validation of a Machine Learning Algorithm to Classify Molecular Subsets of Systemic Lupus Erythematosus (SLE) with Clinical Implications

**Background:** We previously leveraged gene expression (GE) data from a large SLE cohort (n=3,166) to train, validate, and test a random forest (RF) classifier to identify subsets of SLE patients with common molecular patterns of disease. Post-hoc analysis of clinical features revealed significant differences between the subsets in lupus biomarkers, clinical characteristics, and demographics. Thus, actionable patient subsets were identified and could be predicted with machine learning based on GE profiles.

**Purpose:** Here, we apply the RF algorithm to a prospective patient cohort to determine their subset memberships. We also test for significant differences in clinical characteristics to validate the clinical relevance of molecular subsets.

**Methods:** Clinical metadata was collected from 101 SLE patients originating from three clinical trials (NCT03626311, NCT03180021, and NCT03142711) and RNA-sequencing of whole blood was employed to measure GE profiles. Patients met standard classification criteria of SLE and patients from one trial had renal biopsies contemporaneous with GE measurement. The previously developed RF algorithm was applied to classify patients based on molecular endotype. Chi Square test of independence, Chi Square test for trend, and multinomial logistic regression analyses were employed to determine differences in clinical features among the algorithm-predicted subsets.

**Results:** Patients were subsetted into all eight endotypes identified by the algorithm, with molecular patterns mirroring those found previously in the development and testing cohorts of SLE patients. Subsets were designated A through H, in order of lupus-related immunologic aberrancies, with group A reflecting the least number of transcriptional aberrancies and group H representing the most. Serum complement levels, positivity for anti-double-stranded DNA (anti-dsDNA) antibodies and the presence of nephritis differed among the subsets, with the more immunologically aberrant subsets having lower complement, more nephritis and greater odds of anti-dsDNA positivity. Regression analyses revealed that clinical trial of origin, when examined alone or with all other metadata, did not affect the probability of a patient's classification into any one subset. From the multinomial regression considering all metadata, effects of taking oral steroids, baseline serum complement, baseline disease activity and anti-dsDNA positivity all shifted probabilities of some patient classifications into subsets. However, these effects became non-significant after correction for multiple hypothesis testing.

**Implications:** Subsetting SLE patients based on mRNA profiles with machine learning can provide important prognostic information and novel molecular insights in support of personalized management, and is sufficiently robust to classify patients originating from different clinical settings.

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# GWSPH RESEARCH SHOWCASE

# BIOSTATISTICS AND

# BIOINFORMATICS

## ResLens: Detecting Antibiotic Resistance Genes with Large Language Models

**Background:** Antibiotic resistance poses a global health threat, with the World Health Organization estimating up to 10 million deaths annually by 2050 and the CDC reporting 35,000 U.S. deaths each year. Traditional alignment-based tools often miss divergent and novel resistance genes, hampering early intervention. In contrast, recent advances in genomic language models enable decoding complex genetic patterns and predicting resistance determinants. Leveraging these models can overcome current methodological gaps, offering comprehensive surveillance and rapid detection of emerging antibiotic resistance in microbial populations.

**Methods:** We fine-tuned a SeqLens genomic language model to detect and classify antibiotic resistance genes (ARGs) in both short read and whole gene data. We collated ARGs from 13 different antibiotic classes from ResFinder, RefGene, CARD, and ARDB databases for training and validation. We trained a whole gene version and a short read version of the model and developed a pipeline to process WGS data for optimized prediction.

**Results:** ResLens correctly classified 93% of resistance genes in the test dataset, substantially outperforming ResFinder, the state-of-the-art alignment based tool, and DeepARG, the top performing deep learning model. Additionally, ResLens is capable of predicting novel ARGs with little sequence similarity to ARGs in the training dataset.

**Conclusion:** ResLens demonstrated not only state of the art performance on ARG classification, but also an ability to classify unseen ARGs, reducing the reliance on databases that need to be constantly updated to stay apace with new mechanisms of resistance. It enables researchers and public health officials to more quickly and confidently analyze environmental and experimental samples. Additionally, it demonstrates the ability of genomic language models to perform well in other complex gene classification and genotype-to-phenotype tasks.

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# GWSPH RESEARCH SHOWCASE

# BIOSTATISTICS AND

# BIOINFORMATICS

## PlasmidLens: Leveraging Genomic Language Models to Detect Plasmids from Bacterial Sequences

Plasmids are vital components of bacterial genomes, pivotal in various biological functions. However, distinguishing plasmid sequences from chromosomal sequences remains a significant challenge due to the complexity of both short and long reads, which makes accurate attribution of sequences to their respective origins difficult. Existing methods—whether alignment-based, database-driven, or deep learning-based—often fall short in terms of performance or generalization. To address these limitations, we present *PlasmidLens*, an approach based on genomic language models that is capable of identifying plasmid sequences with high accuracy, relying solely on learned probabilistic features of plasmids and chromosomes, without the need for external databases. Our approach is supported by a curated dataset containing unique marker fragments, which capture distinctive characteristics of plasmid and chromosomal classes, facilitating the identification of unique reads. Our benchmarking shows that *PlasmidLens* outperforms Deeplasmid by demonstrating robustness across varying read lengths and efficiency in inference, achieving 3% higher accuracy and a 4% improvement in ROC-AUC. This work highlights the potential of genomic language models in advancing plasmid detection and genomic analysis.

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# GWSPH RESEARCH SHOWCASE

# BIostatISTICS AND

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## Primary Presenter

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## Patient-Centric Benefit-Risk Evaluation of Ticagrelor in Combination with Aspirin in Acute Ischemic Stroke or Transient Ischemic Attack: DOOR Analyses of the THALES Trial

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**Background:** Acute ischemic stroke (AIS) and transient ischemic attack (TIA) are leading causes of long-term disability and mortality. The THALES trial showed that dual antiplatelet therapy with ticagrelor-aspirin reduces stroke recurrence compared to aspirin alone, although at the cost of increased major bleeding. Traditional siloed analyses of endpoints can fall short in fully capturing the complex interaction between efficacy and safety, and in assessing whether this antiplatelet therapy provides a net benefit. This study employs the Desirability of Outcome Ranking (DOOR) framework to provide a more comprehensive, patient-centered benefit-risk assessment.

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**Methods:** The responses from 11,016 THALES trial participants were classified into an ordinal DOOR outcome: 1 (Survived with no events, i.e., most desirable), 2 (Survived with 1 event without disability), 3 (Survived with 1 event without disability), 4 (Survived with at least 1 new event with disability), and 5 (Death, i.e., least desirable). Three events (severe bleeding, stroke, and death) were included in the Component Analysis. The integrated DOOR outcome encapsulates both the benefits and harms into a single, interpretable value that reflects the cumulative patient experience. The DOOR probability—the probability that a patient treated with ticagrelor-aspirin has a more desirable overall outcome than a patient receiving aspirin alone—was estimated based on all possible pairwise comparisons of the DOOR outcome of patients on ticagrelor-aspirin vs aspirin alone. It was estimated using the Wilcoxon-Mann-Whitney statistic with confidence intervals determined via the Halperin et al (1989, Biometrics 45:509-21) method, utilizing the online DOOR App developed at the Biostatistics Center.

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**Results:** The overall DOOR probability was 50.5% (95% CI: 50.0–50.9,  $p=0.0474$ ), suggesting that when both efficacy and safety outcomes are integrated, there is a modest overall benefit from the addition of ticagrelor to aspirin vs. aspirin alone in the treatment of patients with mild-to-moderate acute noncardioembolic ischemic stroke. For the individual components, the door probabilities were 50.6% (50.2%-51%) for stroke, 49.9% (49.8%-50.1%) for death, and 49.8% (49.7%--49.9%) for severe bleeding, suggesting a benefit-risk tradeoff.

**Conclusion:** This analysis shows the utility of the DOOR paradigm in providing a more holistic assessment to inform clinical decision-making and future trial designs by integrating multiple dimensions of patient outcomes into a single patient-centric outcome and conducting robust analyses on this outcome.

# GWSPH RESEARCH SHOWCASE

# BIostatISTICS AND

# BIOinformatics

## How does sleeve gastrectomy change the dynamics of gut microbiome and metabolome for obesity patients?

**Background:** Childhood and adolescent obesity remain a critical global health issue, with sleeve gastrectomy (SG) emerging as a leading surgical intervention for severe obesity. While SG is effective for weight loss, its long-term impact on the gut microbiome and metabolome in youth remains underexplored. This study aimed to characterize microbial and metabolic alterations across their phenotypic consequences over 24 months following SG and to assess their associations with clinical markers of glucose metabolism.

**Method:** This longitudinal cohort study followed 74 participants (30 SG patients, 36 non-surgical controls) under the age of 24 with severe obesity. Stool and blood samples were collected at baseline and at 6, 12, 18, and 24 months. Gut microbiome were profiled using 16S rRNA sequencing, and blood metabolites were quantified using liquid chromatography-mass spectrometry. Microbial diversity was assessed through alpha (Shannon index) and beta diversity (Bray-Curtis distances), and generalized linear mixed models based on Tweedie distributions evaluated associations between clinical characteristics, microbial genera, and metabolites over time.

**Results:** Microbial alpha diversity remained stable post-SG; however, beta diversity significantly differed at 24 months and correlated with *Pref-1* and *HbA1c* levels. SG patients exhibited a reduction in obesogenic genera (*Romboutsia*, *Sutterella*, *Intestinibacter*) and increases in beneficial taxa (*Christensenellaceae R7-group*, *UBA1819*). Metabolomic analyses identified favorable changes in lipid and amino acid profiles, including decreased levels of *Cer(d18:1/24:0)* and increased levels of *Campesterol* and phosphatidylcholines. Specific metabolites showed group-specific interactions with fasting glucose, suggesting improved glucose regulation post-SG. Moreover, temporal dynamics revealed sharper declines in *Escherichia-Shigella* and *Colidextribacter* in SG patients, indicating accelerated microbial and metabolic adaptation.

**Conclusions:** SG induces profound compositional changes in the gut microbiome and significant metabolic remodeling in adolescents and young adults, despite stable microbial richness. These changes are closely associated with improvements in glucose metabolism and other clinical outcomes. The integration of microbiome and metabolome data uncovers potential biomarkers and therapeutic targets for optimizing SG outcomes. These findings highlight the potential of leveraging molecular profiling to enhance personalized approaches in bariatric surgery for youth with severe obesity.

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# GWSPH RESEARCH SHOWCASE

# BIostatISTICS AND

# BIOINFORMATICS

## Patient-centric approaches for antipsychotic medication research: an application of the Desirability of Outcome Ranking (DOOR) and Global Benefit-Risk (GBR) Score

**Background:** Under current clinical trial models, antipsychotic medications may be considered “successful” if they lead to a certain threshold in symptom reduction by an identified mechanism. Yet, antipsychotic side effects are common and often lead to rapid discontinuation. This study will apply an alternate patient-centered approach called the DOOR to a well-known clinical trial called the Preventing Relapse Oral Antipsychotics Compared to Injectables Evaluating Efficacy (PROACTIVE) trial, which compared oral second-generation antipsychotics (SGA) to long-acting injectables (LAIs).

**Methods:** This study is a secondary data analysis of the PROACTIVE trial. Using the DOOR method, patients will be assigned a ‘rank’ based on their individualized experience (combining efficacy and adverse events). The Wilcoxon rank-sum test will be used to determine if a patient from the LAI group had a more (or less) desirable outcome than a patient in the oral SGA group. This analysis employs two endpoints. The first is a standard DOOR consisting of granular ‘ranks’ ranging from 1 to 9 that capture efficacy and adverse events while accounting for the severity of the adverse events. The second is a GBR Score consisting of broad ‘ranks’ ranging from 1 to 5 that capture merely the occurrence of efficacy and adverse events.

**Results:** Examination of individual DOOR components reveals that LAI group participants experienced more moderate adverse events but fewer severe adverse events, with the inverse pattern observed in the SGA group. The GBR Score analysis reveals that the subjects in the LAI group had a significant probability of a more desirable outcome than the SGA group.

**Conclusion:** The DOOR paradigm provides a clear visualization of individualized experience in the clinical trial comparing LAI and oral antipsychotics. The DOOR methodology allows for a patient-centered approach to evaluating outcomes, which is particularly valuable for populations with mental illnesses, where adverse effects significantly impact medication adherence. Understanding trials from the patient’s perspective could lead to better evaluation of psychiatric medications.

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# GWSPH RESEARCH SHOWCASE

# BIOSTATISTICS AND

# BIOINFORMATICS

## Locus-specific HERV expression associated with differentially expressed genes in hepatocellular carcinoma

**Background:** Human endogenous retroviruses (HERVs) harbor accessory proteins that influence cellular processes and have been linked to a wide variety of diseases, including cancer. This study investigates locus-specific HERV expression and its association with gene dysregulation in hepatocellular carcinoma (HCC), a highly prevalent and deadly form of liver cancer worldwide.

**Methods:** We analyzed 424 HCC samples from The Cancer Genome Atlas (TCGA), which comprised 371 tumor tissues and 50 matched normal tissues from a total of 371 hepatocellular carcinoma participants. We employed Telescope to identify and quantify HERV expression across the total RNA sequencing data.

**Results:** The majority of differentially expressed HERVs exhibited reduced expression in tumor tissue (166 downregulated vs. 50 upregulated), suggesting a potential functional role of HERV expression patterns in shaping the pathophysiological landscape of HCC. Specifically, the suppression of HERV-H family members, which are known to regulate cellular differentiation, may contribute to tumor dedifferentiation, increased plasticity, and enhanced metastatic potential. This loss of differentiation control and increased adaptability may play a critical role in driving the progression of liver cancer.

**Discussion:** Our study highlights the critical role of HERV expression in HCC, highlighting the differential regulation of specific HERV families in tumor tissue. For example, HERVH and ERVLE families showed consistent downregulation in tumor samples, while HERVE and HERV9 were more commonly upregulated. These shifts may reflect underlying changes in transcriptional regulation or chromatin structure between normal and malignant tissues. Rather than indicating a singular functional role, the observed expression patterns likely reflect a multifaceted relationship between HERVs and tumor biology. Further studies will be needed to determine whether these expression differences contribute to, or result from, tumor progression and to explore their potential as biomarkers or therapeutic targets.

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# **GWSPH RESEARCH SHOWCASE**

# **BIOSTATISTICS AND**

# **BIOINFORMATICS**

## **Refining Data Presentation in Data and Safety Monitoring Boards Reports: An Example from a Clinical Trial Evaluating Antifungal Therapy in Pediatric Uncomplicated Candidemia**

Data and Safety Monitoring Boards (DSMBs) play a critical role in clinical trials, using emerging data to monitor the welfare of trial participants through assessment of the benefit-risk balance of interventions, and determining whether randomization and follow-up should continue. High-quality DSMB reports are essential for informed decision-making. Unfortunately, in practice, DSMB reports often lack sufficient structure and are excessively lengthy and dense, typically filled with numerous tables and listings. The report volume, coupled with a lack of clear organization, prioritization of presentations, and contextual explanation, can hinder the identification of important treatment effects, and result in sub-optimal DSMB recommendations.

DSMB reports are distinct from other types of clinical trial documentation such as clinical study reports or journal articles. DSMB reports are aimed at its target audience, the DSMB. Reports optimally present data in a way that tells a complete and coherent story, prioritizing clarity and actionable insights.

Comparison of Uncomplicated Candidemia Therapy Duration in Children and Adolescents (COUNT; NCT05763251) is a multi-center, randomized controlled study comparing two antifungal therapy durations in pediatric patients with uncomplicated candidemia. COUNT is employing the Desirability of Outcome Ranking (DOOR) paradigm, a patient-centric paradigm for designing, analyzing, interpreting, and reporting clinical trial results, focusing on patient-centric benefit-risk evaluation. COUNT was designed with three planned interim analyses and biannual safety reviews.

A refined DSMB report template was developed for COUNT in support of effective monitoring. The report emphasizes the use of visual aids, including bar charts, stacked bar charts, forest plots, and predictive interval plots, complemented by concise tables and narrative summaries. The report is designed to distill complex data into clear, digestible presentations that facilitate quick and accurate benefit-risk assessments, by DSMB members. Visual patient stories complement summary tables and figures to provide insights into comprehensive experiences of each participant.

In this talk, we will introduce the DSMB reporting approach, outlining principles for preparing reports and providing practical guidance for ensuring clarity and utility. We illustrate the approach using COUNT as a prototypical example.

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# GWSPH RESEARCH SHOWCASE

# BIostatISTICS AND

# BIOinformatics

## Meta-analytic microbiome target discovery for immune checkpoint inhibitor response in advanced melanoma

**Background & Significance:** Immune checkpoint inhibitors (ICIs) have transformed melanoma treatment; however, patient responses remain variable, and reliable predictive biomarkers are lacking. Emerging evidence indicates that the gut microbiome may influence immunotherapy outcomes, but findings across studies are inconsistent due to small sample sizes and methodological differences.

**Purpose of the Research:** This study aimed to identify robust gut microbiome signatures associated with ICI response in advanced melanoma through a comprehensive meta-analysis. We hypothesized that integrating multi-omic microbiome data across multiple cohorts would reveal microbial taxa and functional features consistently linked to treatment outcomes.

**Methods:** We conducted a meta-analysis of seven publicly available gut microbiome cohorts comprising 678 melanoma patients treated with ICIs. Whole metagenome shotgun sequencing data were analyzed to profile taxonomic composition, metabolic pathways, and biosynthetic gene clusters (BGCs). Batch effect correction was applied to minimize inter-study variability, and multivariable statistical modeling was used to identify microbiome features associated with treatment response.

**Findings & Conclusions:** Our analysis revealed that *Faecalibacterium* SGB15346 and short-chain fatty acid (SCFA) fermentation pathways were enriched in ICI responders, while dTDP-sugar biosynthesis pathways were associated with non-responders. Additionally, RiPP biosynthetic gene clusters showed higher abundance in responders, suggesting a potential role in modulating immune response.

**Implications:** These findings provide evidence that specific gut microbial species and metabolic functions are associated with clinical outcomes in melanoma immunotherapy. By integrating multi-omic data across cohorts, this study offers potential microbiome-based biomarkers and therapeutic targets to improve ICI efficacy. Future studies should validate these findings in prospective clinical settings and explore mechanistic links between microbial functions and immune modulation.

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# Environmental and Occupational Health



# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Pesticide Exposure And The Human Gut Microbiome: A Systematic Review

**Background:** Pesticide use has grown globally over time, and the importance of the human gut microbiome to overall health has become more evident.

**Objective:** I conducted a systematic review to investigate the association between pesticide exposure and dysbiosis of the gut microbiome in humans.

**Methods:** Articles published up to September 20, 2024, were searched and primary studies which investigated the relationship between pesticide exposure and the health and composition of the gut microbiome were considered. Risk of Bias for each individual study and the overall quality and strength of evidence were assessed according to the Navigation Guide Systematic Review Methodology.

**Results:** 8 studies met inclusion criteria for this review, studying the impact of one or more pesticide chemicals on the human gut microbiome. Pesticide exposure was associated with gut dysbiosis in six of eight of these studies, marked by a change in the number of or diversity of certain bacterial species or metabolites. The eight studies included in this review had a moderate risk of bias overall and low quality of evidence. This review found inadequate evidence to assess the toxicity of this relationship.

**Discussion:** The largest limitation for this review was the differences in methodologies used by each of the selected studies. Future research in this field should seek to establish a standard model of assessment, as well as to address potential pathways of toxicity between pesticides and the gut microbiome.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## The Relationship Between Rising Sea Surface Temperature and Rapid Intensification of Hurricanes in the Atlantic Basin: A Systematic Review

**Background:** Extreme weather affects millions of people, increasing health burdens on communities and creating lasting instability. The Atlantic basin is a hotspot for hurricane formation and recent rises in sea surface temperature have been connected to increasing intensity of hurricanes. The 2024 season saw several rapidly intensified ( $>30$  knots windspeed increase/24 hr) hurricanes develop in the Atlantic basin, including Hurricanes Helene and Milton, which led to hundreds of deaths and injuries and billions of dollars in economic loss. Rising sea surface temperature may increase the probability of rapid intensification events.

**Objective:** I reviewed studies investigating the relationship between sea-surface temperature and the probability of hurricanes undergoing rapid intensification (RI) in the North Atlantic basin.

**Methods:** I searched articles published up to October 2nd, 2024, and included original studies that investigated the relationship between sea-surface temperature rise and RI hurricanes in the North Atlantic. I evaluated the risk of bias of studies and the overall quality and strength of the evidence according to the Navigation Guide systematic review methodology.

**Discussion:** The evidence demonstrates that there is a positive correlation between sea surface temperature and probability of RI, particularly in the central, eastern, and Southern N. Atlantic basin. RI hurricane frequency and sea surface temperature have been rising over the past several decades, and a further increase in RI hurricanes is likely to occur under global warming scenarios.

**Conclusion:** I concluded there was sufficient evidence supporting a positive correlation between sea surface temperature and probability of rapidly intensified hurricanes.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## The Impact of Extreme Heat on Childhood Undernutrition in Low and Low-to- Middle-Income Countries: A Systematic Review

**Background:** Undernutrition in children under 5 years of age is a leading cause of death in low and low-to-middle-income countries (LLMICs). As climate change increases extreme heat events, it is important to understand how heat exposure may contribute to childhood undernutrition in these regions.

**Purpose:** The objective of this systematic review was to examine the relationship between extreme heat exposure and undernutrition in children under 5 years old in LLMICs.

**Methods:** The review conducted included studies that measured the exposure of children under 5 to extreme heat and its link to undernutrition. Searches for the studies were conducted on September 23, 2024, September 25, 2024, and October 1, 2024. Studies were included if they focused on children under 5 in LLMICs, examined stunting or wasting as measures of undernutrition, and assessed exposure to extreme heat, high temperatures, and heatwaves. Studies were excluded if they not conducted in LLMICs, did not directly measure stunting or wasting, or were systematic reviews. The primary outcomes were the prevalence of stunting and/or wasting. Risk of bias and the quality and strength of the evidence were assessed using the Navigation Guide systematic review methodology.

**Findings & Conclusion:** Of 697 identified studies, 8 met the inclusion criteria. Positive associations were found between high temperatures and wasting, with effect sizes ranging from 2.2% to 27%. The evidence for stunting was mixed, with some studies suggesting protective effects while others indicated a positive relationship. Overall, the quality of evidence was moderate, and the strength of the evidence was inadequate.

**Implications:** High temperatures, especially above 30°C, were associated with increased rates of wasting, although evidence for stunting was inconsistent. As temperatures continue rising it becomes increasingly important to understand the relationship between extreme heat exposure and undernutrition in children worldwide. further research is still needed to clarify the impact of extreme heat on child undernutrition in LLMIC. This research will be essential in informing the development of targeted interventions to mitigate the effects of climate change on nutrition and health.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## A fetus-at-risk approach to associations between oil and gas development and adverse birth outcomes

**Background:** Despite widespread calls for decarbonization, the oil and gas industry continues to expand in the U.S. A growing body of literature reports associations between living near oil and gas development and higher risk of adverse birth outcomes. However, no study explored these associations using a prospective cohort study with primary data collection.

**Methods:** We used data from U.S. participants enrolled in Pregnancy Study Online (PRESTO), a prospective North American preconception cohort study of self-identified female participants attempting conception without fertility treatment. Among participants whose pregnancy progressed beyond 20 weeks, we obtained birth outcome data from self-administered questionnaires. We created a measure of small vulnerable newborn (SVN) status, a validated clinically relevant composite of low birthweight, preterm, and small-for-gestational-age. Using participants' geocoded addresses, we calculated residential proximity measures to the nearest active oil and gas development site at conception. To evaluate the association between residential proximity to oil and gas development and risk of SVN, we used Cox proportional hazard models to estimate age-adjusted hazard ratios (HRs) and 95% CIs, with gestational weeks as the timescale.

**Results:** Among 5,373 participants in the analytic sample, 17.4% (n=932) gave birth to a newborn categorized as SVN, and 10.5% (n=562) resided within 5km of active oil and gas development. We found that residence within 5km of active oil and gas development was associated with an age-adjusted HR of 1.16 (95% CI: 0.94, 1.43), compared to residence greater than 10km from active oil and gas development. Associations were similar magnitude among components of SVN (e.g., low birthweight, preterm, and small-for gestational-age).

**Conclusion:** Although results were imprecise, our preliminary models indicate that closer residential proximity to oil and gas development is associated with slightly higher risk of SVN.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Hydraulic Fracturing and Increasing Rural Prevalence of Bacterial STDs: A Systematic Review

**Background:** Communities with hydraulic fracturing (fracking) have seen localized increases in bacterial infectious diseases with the influx of predominantly heterosexual male well-workers. Workers become reliant on alternative sexual gratification such as homoerotic experimentation and the local sex worker population to meet their sexual needs. Local medical reporting shows increasing sexual health visits and prescriptions for bacterial STD treatments.

**Objective:** I conducted a systematic review regarding STI rates and the presence of hydraulic fracturing.

**Methods:** I searched for articles published prior to 15 October, 2024, and included quantitative studies combining public data on STI rates and hydraulic fracturing wells within the United States. I evaluated the risk of bias and the strength of the evidence according to the systematic review methodology found in the Navigation Guide.

**Results:** I have determined that there is insufficient evidence at this time to conclude if hydraulic fracturing has a direct impact on STD prevalence, as the body of evidence is too small. All of the articles evaluated found statistically significant results for gonorrhea, however none confirmed significant increases in chlamydia or syphilis.

**Discussion:** At this time there is not enough confirmatory evidence to suggest large scale intervention, however conducting additional studies could increase the strength of evidence enough to change this opinion. Increasing the availability of contraception and free testing is a positive starting point to reduce the prevalence of STDs in rural fracking communities until additional research has been conducted.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Space-based characterization of nitrogen dioxide (NO<sub>2</sub>) pollution diurnal variations and exposure disparities in the United States

**Background:** Despite the overall decrease in emissions of nitrogen oxides (NO<sub>x</sub> = NO + NO<sub>2</sub>) in the United States, racial and ethnic disparities in NO<sub>2</sub> pollution exposure persist, and this pollutant continues to challenge public health due to links between long-term exposure and respiratory and cardiovascular disease. Communities with higher NO<sub>2</sub> levels often are simultaneously burdened by other environmental hazards, lack access to quality food and healthcare, and have a higher risk of disease; thus, disproportionate NO<sub>2</sub> exposure can represent an excess burden on these already overburdened communities. There is a lack of surface-level NO<sub>2</sub> measurements that resolve the steep spatial gradients and the significant daily variations to fully capture inequities in NO<sub>2</sub> pollution. NASA's Tropospheric Emissions: Monitoring of Pollution (TEMPO) satellite instrument, launched in 2023, is the first space-based instrument to monitor major air pollutants across North America at every daylight hour and high spatial resolution.

**Methods:** Here, we use monthly (August 2023 to January 2025) averaged NO<sub>2</sub> measurements for each daytime hour from TEMPO, oversampled to census tracts, to characterize daily variations in racial and ethnic NO<sub>2</sub> disparities over the continental United States, by urban/rural status, and within major metropolitan statistical areas (MSAs).

**Results:** We find substantial variations in NO<sub>2</sub> disparities over the continental United States, with the widest disparities in the early morning (9 AM and 10 AM, local time), followed by mid-morning (11 AM and 12 PM), early afternoon (1 PM and 2 PM), and late afternoon (3 PM and 4 PM). In the early morning, the least white population subgroup (bottom 10% of tracts ranked by proportion of non-Hispanic white population) and the most white subgroup (top 10%) bear 76% higher and 50% lower NO<sub>2</sub> pollution compared to the national average level, respectively. Similar disparity patterns exist in super-urban areas, urban areas, and MSAs. Using a high-resolution, sectorally resolved anthropogenic emissions inventory, the Neighborhood Emission Mapping Operation, we found that on-road NO<sub>x</sub> emissions are the dominant driver of these disparities.

**Conclusions:** Our study offers a first attempt to quantify diurnal variations in NO<sub>2</sub> disparities using novel space-based TEMPO observations over the United States and can inform equitable public health policies to advance health equity and environmental justice.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Transportation Emission Policies and Respiratory Health Outcomes: A Systematic Review

**Background:** Transportation emission policies are an important tool in addressing ambient air pollution in urban populations. While previous research has demonstrated the impact of these policies in reducing vehicle emissions, further research is necessary to evaluate their impact on respiratory health outcomes.

**Objectives:** I conducted a systematic literature review on the effect of urban transportation emission policies in reducing poor respiratory health outcomes.

**Methods:** I evaluated peer reviewed original articles that analyzed the effects of specific transportation emission policies in reducing poor respiratory health outcomes. I then used the Navigation Guide and the ROBINS-I Tool to evaluate the risk of bias for each individual study and the overall quality and strength of evidence.

**Results:** 11 studies met the inclusion criteria and were included in the review. The implementation of transportation emission policies was associated with substantial reductions in poor respiratory health outcomes across the literature. However, the high risk of bias due to confounding, in classification of interventions, and in measurement of outcomes reduced the overall quality of evidence. I therefore concluded the overall body of evidence was “moderate” quality with “limited” evidence of the effects of transportation emission policies in reducing poor respiratory health outcomes.

**Conclusion:** I concluded there was limited evidence of an association between the implementation of transportation emission policies in urban settings and a reduction in poor respiratory health outcomes.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## The Interplay Between Climate Change and Antimalarial Drug Resistance: A Systematic Review

**Background:** Malaria remains a significant global health challenge, disproportionately impacting endemic regions. Climate change intensifies the challenges of malaria control by fostering ecological conditions conducive to vector proliferation, while simultaneously accelerating the development of antimalarial drug resistance through genetic adaptations in *Plasmodium* parasites.

**Objectives:** This systematic review critically examines the intersection of climate change and antimalarial drug resistance. Specifically, it investigates how climatic factors - temperature, rainfall, and humidity-drive resistance emergence and explores their implications for malaria control strategies in endemic regions.

**Methods:** Employing the Navigation Guide methodology, this review evaluated peer-reviewed literature sourced from PubMed, Scopus, and Web of Science. Inclusion criteria encompassed studies addressing climate variability, malaria transmission dynamics, and the development of antimalarial drug resistance. Methodological robustness was ensured through rigorous evidence appraisal.

**Discussion:** Findings highlight significant knowledge gaps in understanding the synergistic effects of climate change and drug resistance. While existing studies suggest that climatic shifts promote *Plasmodium* adaptation through altered transmission dynamics and selective drug pressure, the evidence is constrained by regional biases, indirect assessments, and inconsistent methodologies. Addressing these limitations requires targeted, interdisciplinary research to elucidate the causal pathways and mitigate the compounded threats posed by climate change and resistance.

**Conclusion:** The interplay between climate change and antimalarial drug resistance presents a major obstacle to achieving global malaria control targets. Advancing research and implementing adaptive policy frameworks are imperative to sustain progress and treatment amidst escalating environmental and epidemiological complexes.

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# **GWSPH RESEARCH SHOWCASE**

# **ENVIRONMENTAL AND**

# **OCCUPATIONAL HEALTH**

## **Extreme Weather, Toxic Legacy: A Scoping Review of Climate Change Driven Chemical Exposures in Vulnerable Populations**

Climate change is reshaping environmental exposure patterns, yet the intersection between major climatic events and chemical exposure remains underexplored. This scoping literature review examines how extreme climate-related events such as floods, wildfires, hurricanes, and heatwaves influence the distribution, concentration, and human exposure pathways of harmful chemicals. Particular attention is given to vulnerable populations, including low-income communities and populations in the Global South, who are disproportionately affected by both climate impacts and toxic exposures. The review synthesizes peer-reviewed literature published over the last two decades, drawing on multidisciplinary sources to map existing knowledge, identify geographic and methodological gaps, and highlight emerging exposure pathways that are being intensified by climate instability.

Preliminary findings suggest that major climatic events contribute to the remobilization of legacy pollutants, increase human contact with industrial and agricultural chemicals, and deepen existing environmental health disparities. Specifically, wildfire smoke, floodwaters, and re-suspended sediments were found to transport a wide range of toxicants—including fine particulate matter, polycyclic aromatic hydrocarbons, heavy metals, pesticides, and volatile organic compounds—linked to adverse perinatal outcomes, respiratory illnesses, cancer risks, and mental health effects. The literature recommends several scientific, programmatic, and policy actions, including the expansion of real-time environmental monitoring, integrated chemical and microbial risk assessments, investment in climate-resilient infrastructure, and a stronger emphasis on equity-focused disaster preparedness and response. This review aims to inform future research and policy efforts by clarifying the mechanisms linking climate events to chemical risk and by underscoring the urgency of adaptive, community-centered strategies to protect those most at risk.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Residential and Occupational Non-Ionizing Radiation Exposure and Thyroid Hormone Levels: A Systematic Review

**Background:** The amount of environmental electromagnetic field exposure has risen in residential and occupational settings as the use of electronic technology has increased. While many studies have investigated the impact of radiation in animal models, very few have investigated the impact on human thyroid health.

**Objectives:** To investigate the impact of increasing non-ionizing electromagnetic field exposure in residential and occupational settings on thyroxine, triiodothyronine, and thyroid-stimulating hormone levels in humans.

**Methods:** Utilizing the Navigation Guide process, the literature was searched for relevant studies and evaluated for risk of bias, quality, and strength of evidence.

**Results:** 5 studies were included in this review, two that focused on residential exposures and 3 that focused on occupational exposures. The included studies reported a consistent trend in decreasing triiodothyronine (T3) and thyroxine (T4) levels, and a less consistent trend in rising thyroid stimulating hormone levels in response to the exposure. Several studies reported statistically significant results. All studies were evaluated as either a “probably low” or “probably high” risk of bias across the listed domains and the overall quality of evidence was evaluated as moderate. The strength of evidence was ultimately evaluated as limited based on variations in the evidence and limitations of the included studies.

**Discussion:** There is limited evidence in human studies for an association between non-ionizing electromagnetic field exposure and thyroid hormone levels, however, the current body of work serves as proof that further research on this topic is needed.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## The Impact of Anticipatory Disaster Risk Reduction on Mental Health Outcomes in Oceania: A Systematic Review

**Background:** Climate change is driving the intensification and increased frequency of natural disasters in Oceania. Natural disasters have a negative mental health impact on those affected. Disaster risk reduction has been adopted as an intervention framework seeking to mitigate disaster impact. In Oceania, there is great need and a willingness to implement disaster risk reduction interventions by people, governments, and organizations.

**Objectives:** I conducted a systematic review to identify a potential association between anticipatory disaster risk reduction interventions in Oceania and the improvement of mental health outcomes.

**Methods:** I formulated my study question into a “PICO Statement” and developed a search strategy accordingly. I implemented my search strategy on 29 September 2024. My search syntax was applied to five databases and results were uploaded to Covidence for two rounds of screening. An adapted version of Navigation Guide methodology and Cochrane’s ROBINS-I tool were used for risk of bias, strength, and quality of evidence assessment.

**Results:** Five studies were included after screening. They spanned two countries (Australia and Fiji) and covered five different natural hazards (bushfires, cyclones, floods, coastal erosion, and saltwater intrusion). The studies possessed a “Serious Risk of Bias” with confounding and measurement of outcomes being significant sources. Bias from classification, deviation from the intervention, missing data, and selection of reported results were variable and of less concern. The evidence across the literature was of “Low” quality with risk of bias, indirectness, and imprecision concerns. The overall strength of the evidence was “Inadequate” for establishing an association between anticipatory disaster risk reduction and the improvement of mental health outcomes.

**Discussion:** I concluded that the current literature possesses inadequate evidence of anticipatory disaster risk reduction improving mental health outcomes. Further research should occur in Pacific Island nations and include both clinical and non-clinical measurements of mental health outcomes.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Private Well Water and Gastrointestinal Illness in the United States and Canada: A Systematic Review

**Background:** In the United States and Canada, about 50 million people rely on private well water as their primary source of drinking water. In both the US and Canada, private well water is not federally regulated. Microorganisms transmitted through drinking water can cause gastrointestinal illness.

**Objectives:** I conducted a systematic review regarding exposure in the US and Canada to private well water as a primary drinking source and gastrointestinal illness occurrence. The objective was to determine the association between private well water and gastrointestinal illness.

**Methods:** Using the Navigation Guide, I rated the risk of bias and quality of evidence for six studies acquired from four databases. I rated the overall strength of evidence across the six studies.

**Results:** The final six studies included three cross-sectional studies, one case-control study, one cohort study, and one case-case study. Three of the six studies found an elevated odds ratio or relative risk, two studies found no correlation, and one study found an inverse relationship between exposure and outcome. The overall body of evidence was determined to be inadequate evidence of toxicity due to concerns of confounding and lack of consistency across studies.

**Discussion:** Future research should control for exposures to GI sources outside of the studied water source. More research is needed to determine if exposure to private well water creates a higher risk for gastrointestinal illness.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Green Building Rating Systems and Occupant Mental Health: A Systematic Review

**Background:** Mental health disorders affect approximately 50% of the global population. 87% of life is spent indoors which may increase potential indoor exposure factors that could impact mental health.

**Objectives:** I conducted a systematic literature review encompassing the association between Green Building interventions and the mental health of the occupants.

**Methods:** I searched relevant literature published before September 25, 2024, that included peer-reviewed studies focused on the question, Do green buildings protect occupants' mental health? I evaluated the risk of bias and overall quality and strength of evidence of the studies utilizing the Navigation Guide systematic review methodology.

**Results:** A judgement of limited evidence of a protective association between green buildings and occupant mental health was made across the seven studies that met the inclusion criteria. There was a substantial risk of bias across the studies, specifically in categories of blinding, confounding, and outcome assessment methods. Mental health outcomes were measured using different methods across all studies, which makes understanding the magnitude of effect difficult. Of the seven studies, six different green building rating systems were used to assess both office buildings and residential homes. Though a majority of studies found a protective effect between green buildings and mental health, the high risk of bias, unclear magnitude of effect, and small body of evidence lead to a rating of low quality of evidence.

**Discussion:** Green building rating systems contain widely different methodologies and goals making comparisons between studies a challenge, however, association with improved mental health was consistent across multiple systems. Randomized control trials with objective measures of mental health would improve the quality and strength of evidence. The co-benefit of improved mental health outcomes with climate change mitigative effects underscores the importance of prioritizing green building.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Exposure to Cleaning Chemicals and Respiratory Health Risks in Meat Processing Workers: A Systematic Review

**Background:** Exposure to cleaning and sanitizing chemicals is associated with adverse respiratory health outcomes; however, evidence regarding the association for workers, specifically in the meat processing industry, is limited.

**Objective:** I applied the Navigation Guide to examine the association between using standard cleaning, sanitizing, and disinfecting chemicals in the meat processing industry and adverse respiratory health outcomes

**Methods:** I systematically searched five electronic databases for studies reporting a measurement of the association between exposure and diagnosis. I followed the navigation guide systematic review methodology and evaluated the risk of bias in the included studies and the overall quality and strength of evidence.

**Results:** Six studies met the inclusion criteria. Three measured chlorine exposure, one measured nitrogen trichloride, two measured ammonia, and one used a generic “sanitizing chemical.” Nearly all studies had some risk of bias in terms of confounding and exposure assessment. The expansive risk of bias across studies, as well as inconsistencies in the direct effects found in those studies, led me to conclude that there was low-quality evidence and inadequate evidence of toxicity.

**Conclusion:** Based on the application of the Navigation Guide systematic review methodology, there is insufficient evidence of toxicity supporting an association between cleaning, sanitizing, and disinfecting chemicals in the meat processing industry and adverse respiratory health outcomes.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## The Effect of Green Energy Transitions for Electricity Generation on Particulate Matter in Urban Areas of China: A Systematic Review

**Background:** The Navigation Guide’s systematic review methodology was adapted and applied to identify and assess literature on particulate matter emissions after green energy transitions for electricity generation. I conducted a systematic review to investigate if urban areas in China have seen reduced particulate matter emissions as they transition from coal-based electricity generation to green energy electricity generation, including renewables.

**Objectives:** I conducted a systematic literature review of green energy adoption for electricity generation on PM2.5 and PM10 levels in Chinese cities.

**Methods:** I searched articles up to 29 September 2024 and included historical time-based studies in China that demonstrated an electricity generation transition from coal to renewable energy sources and measured particulate matter over the same time interval. I evaluated the risk of bias of individual studies and the overall quality and strength of evidence according to the Navigation Guide systematic review methodology, with risk of bias domains adapted from the ROBINS-I tool. Inclusion and exclusion criteria were established to make sure that intervention, outcome and study type were consistent.

**Results:** I identified five studies that fit my inclusion criteria and examined the time-based effect on particulate matter from green energy adoption for electricity generation. In all five studies identified in the review, PM2.5 and PM10 in urban areas of China decreased over time as green energy adoption increased. Since many interventions were implemented in tandem, it is difficult to identify the effect of green energy transitions for electricity generation alone.

**Discussion:** Through following the Navigation Guide methodology and adapting risk of bias domains from ROBINS-I tool, I conclude that there is “limited” evidence to conclude that green energy adoption for electricity generation is associated with reduced particulate matter emissions in urban areas of China.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## The Impact of Traffic Noise on Cognitive Function in Children

**Objectives:** This systematic review investigates the impact of road traffic noise on cognitive function in children aged 6–12 years in urban settings, focusing on attention, memory, and academic performance.

**Methods:** A systematic search of PubMed and Scopus identified studies examining traffic noise and cognitive outcomes. Inclusion criteria required studies to assess noise exposure and report cognitive outcomes. A narrative synthesis was conducted, and the GRADE system was used to evaluate evidence quality.

**Results:** From 1666 records, 6 studies met the inclusion criteria, with sample sizes ranging from 553 to 7555 children. Most studies reported negative associations between traffic noise and cognitive outcomes, particularly attentional deficits and reduced academic performance. One study found no significant effects, highlighting inconsistencies. The evidence quality was moderate, limited by methodological heterogeneity and risk of bias. Co-exposure to pollutants like NO<sub>2</sub> and PM<sub>10</sub> amplified cognitive impairments.

**Discussion:** School environments were more strongly affected by traffic noise than residential settings, with complex cognitive tasks being particularly vulnerable. The interplay between noise and air pollution underscores the need for integrated mitigation strategies. Further high-quality longitudinal studies are needed to clarify causal pathways and long-term effects.

**Conclusions:** Road traffic noise poses a significant risk to cognitive development in children. Policy interventions, such as noise reduction near schools and improved urban planning, are essential to protect vulnerable populations and promote healthy cognitive development.

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# **GWSPH RESEARCH SHOWCASE**

# **ENVIRONMENTAL AND**

# **OCCUPATIONAL HEALTH**

## **Mortality estimates attributed to nitrogen dioxide air pollution in the New York City metropolitan region**

The New York City (NYC) metropolitan region represents a large source of atmospheric nitrogen dioxide (NO<sub>2</sub>), primarily driven by emissions from various forms of fossil fuel combustion. Source apportionment of NO<sub>2</sub>—quantifying the contributions of individual emission sectors to ambient concentrations—remains challenging for this region, due to the diversity of emission sources and land-sea interactions from the nearby Long Island Sound and Atlantic Ocean. The NYC region is currently in non-attainment of the Environmental Protection Agency National Ambient Air Quality Standards for ozone (O<sub>3</sub>), a harmful secondary pollutant influenced by NO<sub>2</sub>, further necessitating an improved understanding of sectoral contributions to air pollution.

Here, we quantify contributions from different emission sectors to NO<sub>2</sub> pollution in NYC and assess the resulting impacts on mortality. We simulate air quality for a broader NYC metropolitan domain using the Comprehensive Air Quality Model with Extensions (CAMx) at 1.33 km x 1.33 km spatial resolution for May-September 2018. We evaluate the performance of CAMx NO<sub>2</sub> and O<sub>3</sub> concentrations against (1) ground-based, (2) airborne and (3) space-based observations. We then perform a health impact assessment to estimate sector-by-sector mortality conferred by NO<sub>2</sub> exposure.

We find that CAMx exhibits a positive bias in NO<sub>2</sub> and O<sub>3</sub> concentrations, particularly in densely-populated areas, suggesting possible overestimates in emissions inputs. The source apportionment feature of CAMx that tags emissions from different point and area sources indicates that the majority of surface NO<sub>2</sub> in the NYC region stems from residential and commercial emissions sources, followed by on-road vehicle emissions. Incorporating surface NO<sub>2</sub> concentrations with age-specific, fine scale (census tract) mortality rates and population data, we estimate approximately 12,500 NO<sub>2</sub>-attributable deaths per year in the NYC metropolitan region—over 6000 of which are attributable to residential and commercial sources. By identifying the dominant sources of NO<sub>2</sub> and quantifying the health impacts, this work can inform regulatory efforts aimed at improving air quality and protecting public health in the NYC metropolitan area.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## The Association Between Overcrowded Hurricane Shelters and Infectious Disease Risk: A Systematic Review

**Background:** With the intensification of hurricanes and other natural disasters due to climate change, it is important to consider how emergency shelter conditions contribute to overall human health. Overcrowding, one possible condition in shelters, is a significant issue that affects long-term health outcomes in a given population. Characteristics of overcrowding, such as increased physical contact, lack of privacy, poor hygiene, and lack of sleep have been widely recognized with an increased risk of infectious diseases.

**Objectives:** This systematic review explores the hypothesis that individuals residing in overcrowded hurricane shelters are positively associated with increased outbreaks of infectious diseases, namely influenza, measles, and skin infections.

**Methods:** The Navigation Guide Framework was adopted to conduct literature reviews in PubMed, Scopus, Google Scholar, CINAHL, and Web of Science. Articles were screened for relevance and excluded based on predetermined criteria (e.g., studies in the last 20 years, individuals living in hurricane shelters, outcomes focusing on mental health stressors). Of 106 studies, five articles met the inclusion criteria and were assessed for risk of bias, quality of evidence, and strength of evidence.

**Results:** Five studies were included in the systematic review. Four out of five studies found a positive association between overcrowded hurricane shelters and infectious disease risk.

**Discussion:** Further and more robust studies are needed to determine the strength of association between overcrowded shelter conditions and infectious disease risk. Future work should also incorporate epidemiological studies to investigate the causality between overcrowding, the contributing factors (lack of privacy, poor hygiene), and infectious disease risk. Stronger evidence can help health officials advocate for increased disaster preparedness for all communities.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Associations between city-level socioeconomic status and urban air pollution-related disease burdens across 13,000 cities worldwide

**Objective:** Area level socioeconomic status (SES) is associated with air pollution and related health impacts. However, studies characterizing this association are still limited to developed countries. We examine the associations between city-level SES and disease burdens attributable to fine particulate matter (PM<sub>2.5</sub>), nitrogen dioxide (NO<sub>2</sub>), and ozone (O<sub>3</sub>) from a global perspective, using state-of-the-science datasets covering 13,189 cities worldwide.

**Material and Methods:** All-cause mortality attributable to PM<sub>2.5</sub>, new-onset pediatric asthma attributable to NO<sub>2</sub>, and chronic respiratory disease mortality attributable to O<sub>3</sub> were calculated at the city-level, using pollution data from global gridded air pollution datasets and disease rates and concentration-response functions from the Global Burden of Disease (GBD) 2021 study. We used Bayesian multilevel Poisson regression to identify associations between these disease burdens and city-level SES, measured with the Human Development Index (HDI) which ranges from 0 (lowest development) to 1 (highest). We controlled for various city- and country-level sociodemographic and geographic characteristics, including total population, population density, total area, and climate.

**Results:** Globally, we found a significant negative association between city-level SES and disease burdens attributable to PM<sub>2.5</sub> (0.29% decrease in PM<sub>2.5</sub>-attributable mortality rate per 0.01 HDI increase; 95% Credible Interval (CrI): -0.43, -0.15) and a significant positive association with disease burdens attributable to NO<sub>2</sub> (6.81% increase in NO<sub>2</sub>-attributable asthma incidence rate per 0.01 HDI increase; 95% CrI: 6.40, 7.21). Disease burdens attributable to O<sub>3</sub> did not show a significant association after adjusting other covariates (0.06% increase in O<sub>3</sub>-attributable mortality rate per 0.01 HDI increase; 95% CrI: -0.17, 0.29).

**Conclusion:** City-level SES was associated with PM<sub>2.5</sub>- and NO<sub>2</sub>-attributable disease burdens, but in opposite directions. Our findings shed light on disparities in disease burdens attributable to air pollution across cities with different development levels globally. This information can be helpful to improve environmental conditions in overburdened cities.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## The Impact of Aerosolized Brevetoxins on Asthma Symptoms: A Systematic Review of Respiratory Health Risks from Harmful Algal Blooms

**Background:** Harmful algal blooms (HABs), particularly those caused by *Karenia brevis* in the Gulf of Mexico, produce aerosolized brevetoxins that pose significant respiratory risks, especially to asthmatic individuals.

**Objectives:** This systematic review examines the association between aerosolized brevetoxin exposure and asthma symptoms to better inform public health research priorities and practices.

**Methods:** A systematic review was conducted following the Navigation Guide framework, focusing on human studies evaluating the effects of aerosolized brevetoxins on asthma symptoms. Literature searches were performed in PubMed, Scopus, EBSCOhost, and Web of Science using predefined search terms and inclusion criteria. Studies were assessed for risk of bias using established guidelines and graded for quality and strength of evidence using the GRADE approach.

**Results:** Of the 607 studies identified, five met the inclusion criteria. All studies were conducted in Florida coastal areas and measured respiratory outcomes in asthmatic populations exposed to aerosolized brevetoxins. Spirometry data was collected in four studies, with three reporting significant declines in pulmonary function, including reduced FEV<sub>1</sub>, FEV<sub>25-75</sub>, and PEF values. Self-reported respiratory symptoms, such as coughing and throat irritation, were consistently associated with brevetoxin exposure across all studies. One study demonstrated a dose-response relationship, strengthening the evidence for causality. Major limitations included variability in exposure assessments, usage of aquatic brevetoxin measurements instead of air concentrations, and limited study numbers. Despite these challenges, findings consistently indicate that aerosolized brevetoxins exacerbate respiratory symptoms in asthmatic individuals.

**Conclusions:** This review emphasizes the respiratory risks posed by *K. brevis*-related HABs, particularly for vulnerable populations like asthmatics. While the evidence supports an association, gaps remain in understanding long-term effects, exposure biomarkers, and variability in airborne brevetoxin concentrations. These findings highlight the need for further research and public health strategies to mitigate risks as climate change intensifies HAB occurrences.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Uncovering the Hidden Burden of Triazole-Resistant *Aspergillus tubingensis*

Fungal infections caused by *Aspergillus* species are a global public health threat, affecting over 4 million people and causing 2 million deaths annually.<sup>1,2</sup> While *A. fumigatus* remains the predominant cause of invasive aspergillosis, infections caused by black-spored *Aspergillus* species, particularly those within the *Aspergillus niger* complex, are on the rise. In clinical settings, *Aspergillus* isolates are typically identified based on morphology and no susceptibility testing is done prior to treatment. Given the dearth of information on this pathogen of growing concern, we aim to characterize the species makeup and drug-resistance of clinical black *Aspergillus* infections. To test for resistance, we attempted to culture 1780 isolates on RPMI-glucose-MOPS agar media in the presence 3 clinically-relevant triazole drugs (itraconazole, voriconazole, and posaconazole). Resistance was treated as a binary and any growth was considered putatively resistant. To characterize species, DNA was extracted from 80 putative black *Aspergillus* clinical isolates, sent to whole genome sequencing, and species assignments were made using phylogenetic analysis. We found that 74% of clinical isolates sent to WGS were *A. tubingensis* and only 12% were *A. niger*. Furthermore, we found that 15.8% of black *Aspergillus* isolates were resistant to at least one drug whereas only 2.3% of putative *A. fumigatus* isolates were resistant. Ultimately, *A. tubingensis* is a prevalent but underrecognized cause of aspergillosis in Southern California, and its frequent misidentification and high triazole resistance underscore the need for improved diagnostics and routine antifungal susceptibility testing.

1. Casalini G, Giacomelli A, Antinori S. The WHO fungal priority pathogens list: a crucial reappraisal to review the prioritisation. *Lancet Microbe* 2024; 5: 717–24.
2. Denning DW. Global incidence and mortality of severe fungal disease. *Lancet Infect Dis* 2024; 24: e428–38.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Occupational Exposure to Antineoplastic Agents and Infertility Risk Among Nurses: A Systematic Review

**Background:** Occupational exposure to antineoplastic drugs (ADs) poses significant risks to oncology nurses during preparation, administration, and patient care, including reproductive health issues like infertility. Infertility is increasingly prevalent worldwide, affecting approximately 17.5% of people.

**Purpose of Research:** This systematic review investigates the research question: Does occupational exposure to antineoplastic agents significantly increase the risk of infertility among nurses? The review uses a structured approach based on the PECO framework. Nurses were chosen as the focus population due to their high exposure risk and unique role in healthcare settings.

**Methods:** A comprehensive search was conducted using Scopus, PubMed, Web of Science, CINAHL, and Google Scholar to identify relevant studies. The search terms were related to the population, exposure to anticancer agents, and infertility outcomes. Studies were evaluated for risk of bias and quality of evidence using the Navigation Guide systematic review methodology. Data extraction was performed using an Excel table, capturing details on study design, population characteristics, exposure assessment methods, and outcome measures. The risk of bias for each study was evaluated using criteria adapted from the Navigation Guide framework. The quality of evidence was assessed using a method adapted from the Navigation Guide, and the strength of evidence was evaluated using criteria that considered the quality of the body of evidence, the direction of effect estimates, and the confidence in those estimates.

**Findings:** Six studies were included in the review, conducted in Iran, the Netherlands, the United States, Canada, and Egypt. The studies consistently demonstrated a significant association between occupational exposure to ADs and infertility among nurses. Infertility rates among exposed individuals ranged from 11.4% to 31%, compared to lower rates in control groups. The exposed groups also observed a prolonged time to pregnancy (TTP). The quality of evidence was categorized as moderate, while the strength of the findings was limited. Most studies received a high risk of bias rating for recruitment strategy, knowledge of exposure groups, and exposure assessment.

**Implications:** The findings suggest a possible association between occupational exposure to antineoplastic drugs (ADs) and infertility in nurses. This underscores the urgent need for improved safety measures and further research to guide policy changes that address regional disparities and investigate long-term effects. Healthcare institutions must acknowledge the potential dangers that antineoplastic drug exposure poses and implement comprehensive approaches to minimize the risks.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Examining Comprehensive Strategies To Address Gender-Based Violence: A Case Study Of Nigeria.

**Background:** Gender-based violence (GBV) is a global issue that disproportionately affects women and girls, leading to severe physical, emotional, and social consequences. In Nigeria, GBV is widespread due to gender inequality, harmful norms, poverty, and weak law enforcement. The prevalence of GBV-related injuries among women in Nigeria is a pressing concern that demands urgent attention due to gaps in data collection, limited awareness, and inadequate prevention. This study seeks to provide a detailed analysis of the burden, characteristics, and crucial factors associated with injuries related to GBV among women in Nigeria, intending to contribute to ongoing efforts to combat GBV and enhance the overall well-being and safety of women in Nigeria.

**Methodology:** This study explores the various approaches used to combat gender-based violence (GBV) in Nigeria, a country that faces significant challenges related to this issue. It offers a detailed review of existing literature and examines strategies implemented by government agencies, non-governmental organizations, and community groups. The case study highlights the cultural, social, and legal factors that influence GBV in Nigeria and the effectiveness of educational programs, legal reforms, and community outreach initiatives. Through this comprehensive analysis, the research aims to identify best practices and recommend actionable solutions to reduce the prevalence of gender-based violence in the country.

**Findings:** Research indicates that despite challenges in data collection, the prevalence of GBV in Nigeria is alarmingly high. It is estimated that 28% of women in Nigeria have experienced physical violence, while 14% have reported experiencing sexual violence at some point in their lives. The findings reveal that physical violence, including beatings and assaults, is the most common form of GBV, leading to various injuries such as burns, bruises, fractures, severe head trauma, and even fatalities. Additionally, sexual violence, including rape and sexual assault, is widespread, resulting in psychological and emotional trauma, unwanted pregnancies, fistula, reproductive health issues, depression, anxiety, post-traumatic stress disorder, and sexually transmitted infections.

**Implications:** The ramifications of GBV-related injuries are profound and pervasive, impacting individuals on multiple levels. New and innovative strategies are needed to reduce the burden of GBV-related injuries and to promote the safety and well-being of women in Nigeria. By shedding light on the complexities of this issue, it is hoped that the research will inform evidence-based solutions and contribute to significant and positive change in addressing GBV-related injuries in Nigeria.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## A quantitative health impact assessment of urban greenspace and all-cause mortality across 1,041 global cities

**Background & Significance:** Urban greenspaces are associated with improved health and climate resiliency. Large scale health impact assessments of urban greenspace and mortality have been limited to American and European cities and have estimated health impacts using theoretical changes in greenspace.

**Purpose:** We estimated changes in mortality associated with observed differences in population-weighted greenest season normalized difference vegetation index (NDVI) between 2014-2018 and 2019-2023 across 1,041 global cities representing 174 countries.

**Methods:** We used publicly available high-resolution satellite-derived estimates of NDVI and population, baseline disease rates from the Global Burden of Disease study, and a hazard ratio of the association between NDVI and all-cause mortality from an epidemiological meta-analysis.

**Findings & Conclusions:** We found that urban greenspace varies substantially across cities (NDVI mean: 0.270, range: 0.072, 0.580) and by climate classification and geographic region. Despite modest global average changes in NDVI from 2014-2018 to 2019-2023, NDVI has changed by over +/-20% in individual cities. Median regional changes were largest in South-eastern Asia (-0.022), Sub-Saharan Africa (-0.010) and Eastern Asia (+0.014) and most stable in arid climates (<0.000). These changes were associated with a global median of 0.29 additional annual deaths per 100,000 in the 2020 population, ranging from 24.44 fewer to 21.84 more deaths per 100,000 across cities. NDVI is generally higher and more stable in European and North American cities, where epidemiologic studies and health impact assessments of NDVI and all-cause mortality have focused.

**Implications of Findings:** Our results highlight large heterogeneity in urban greenspace extent and variability across global cities and the importance of characterizing the health implications of NDVI in more diverse contexts.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

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## A Systematic Review of Heart and Neurological Conditions and Association with Open Burn Pit Exposure in the United States Military Veterans

**Background:** The full effects of open burn pit exposures on veterans' health is not well understood, nor well researched.

**Objective:** This systematic review aims to explore the link between open burn pit exposure and heart or neurological health outcomes in US veterans of the Gulf War and the War on Terror.

**Methods:** This review followed the navigation guide for systematic reviews. I searched three databases, PubMed, Scopus, and Web of Science on October 3, 2024, for articles looking at the exposure of burn pits with the outcomes of heart or neurological conditions. The risk of bias and the quality and strength of evidence was rated according to criteria in Johnson et al, (2014).

**Results:** Five studies meet the exclusive and inclusion criteria for this review. I rated biases probably high risk for confounding and exposure assessment. There was increased risk of migraines, hypertension, and strokes in three of the studies, but these results were contradicted by the results of the other two studies. I conclude there is inadequate evidence that open burn pit exposure leads to an increased likelihood of veterans developing a heart or neurological condition due to the confounding factors and conflicting evidence.

**Discussion:** There is a need for further studies to look at this topic with new methods such as using biomarkers to look at the exposure. Future studies do need to control for confounders such as smoking and lifestyle choices. Research of burn pit exposure is important for treatment and future legislation.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Exposure to Passive Cooling Interventions in Indian Cities and Heat-related Health Outcomes: A Systematic Review

**Background.** India is the second most populous country, with one of the highest densities of cities. Rising temperatures and negative health impacts of the urban heat island effect are pushing city officials to pursue passive cooling strategies in public spaces to tackle the issue.

**Objective.** To conduct a systematic review looking at the association between passive cooling interventions in Indian cities, including urban greening, water bodies, and building type and density, with heat-related health outcomes and potential risk.

**Methods.** I searched articles published between 2020 - 2024, and included articles that studied Indian cities over 100,000, and focused on any form of outdoor passive cooling, excluding indoor interventions and occupational outcomes. Articles were then evaluated based on their risk of bias of individual studies and the overall quality and strength of the evidence according to the Navigation Guide's systematic review definitions.

**Discussion.** The final review included six studies comparing the frequency and density of passive cooling interventions in regions within cities to their associated local temperature. The evidence demonstrates that wide-spread implementation of passive cooling interventions does measurably reduce surrounding surface temperatures, improving thermal comfort for populations within the area. The studies are limited by their indirect assessment of health outcomes but show a clear correlation between the exposure and key health factor, prolonged heat exposure.

**Conclusion.** There was limited evidence supporting the direct impact on passive cooling interventions on heat-related health outcomes in Indian urban populations.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## **The Impact of Environmental Conditions on Substance Use Disorder in Vulnerable Populations in Thailand: A Systematic Review**

*Background:* I adapted and applied the Navigation Guide’s methodology to assess literature on environmental stressors, such as natural disasters and the built environment, and substance abuse in Thailand.

*Objectives:* This systematic review answers “How do poor environmental conditions, such as natural disasters and one’s built environment, influence substance abuse disorders and alcohol-related health outcomes in Thailand among those vulnerable to or dealing with addiction?”

*Methods:* I applied the steps of the Navigation Guide to identify relevant literature based on a Population, Exposure, Comparator, Outcome (PECO) statement and select studies based on inclusion and exclusion criteria. I analyzed and assessed the risk of bias and evaluated the quality and strength of the body of evidence from the included studies.

*Results:* I identified five studies that fit my inclusion criteria. The quality of evidence was rated as ‘low’ and the strength of evidence was rated as ‘low’.

*Discussion:* The evidence suggests that the residents of Thailand who have experienced an environmental stressor or live in a vulnerable environment have an increased risk of developing substance use disorder compared to those who have not experienced an environmental stressor.

*Conclusion:* There is “limited evidence of toxicity” for environmental stressors and substance abuse in Thailand. More studies are needed to determine the strength of the relationship.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## WASH for Learning: Reducing Absenteeism in Rural Primary Schools through Water, Sanitation, and Hygiene Interventions

**Background:** The vast majority of literature concerning water, sanitation and hygiene (WASH) interventions focuses on morbidity and mortality outcomes. This systematic review explores the impact that these interventions have on a social outcome, school absenteeism.

**Objectives:** To examine the effectiveness of school-based water, sanitation, and hygiene (WASH) interventions in the reduction of absenteeism in rural primary schools in low- and middle-income countries.

**Methods:** Following the Navigation Guide Framework, I systematically searched literature databases for studies that reported the outcomes of various WASH interventions. Identified studies were evaluated using a predefined inclusion and exclusion criteria and were later assessed individually for risk of bias, and overall quality and strength of evidence.

**Results:** Six studies were included in this systematic review. Each study measured absenteeism as a primary or secondary outcome. Risk of bias due to confounding and deviation from the intended intervention was identified in all studies, which resulted in “moderate” risk of bias ratings. However, two of the studies received “serious” risk of bias ratings, due to confounding and missing data. The overall quality of evidence was determined to be “low”. The strength of evidence was determined to be “inadequate,” as results were not coherent or consistent across studies.

**Discussion:** Literature that highlights the impact of WASH interventions on social outcomes is limited, and further research is needed to determine if these interventions can produce sustained beneficial outcomes. The results of this systematic review align with other literature reporting mixed findings for WASH interventions in school-based settings.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

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## The Impact of Breastfeeding on the Development of the Infant Gut and Nasal Microbiomes

**Introduction:** Breastfeeding plays an important role in shaping both the gut and nasal microbiomes of infants. Despite its well-documented benefits for maternal and infant health, only 25% of U.S. infants meet the recommended six months of exclusive breastfeeding. Factors such as socio-demographic disparities and breastfeeding difficulties contribute to early cessation. Research suggests that breastfeeding not only supports the development of beneficial gut bacteria but also influences the nasal microbiome, which may have a role in host susceptibility respiratory infections. However, the relationship between breastfeeding and the nasal microbiome remains understudied. This study aims to evaluate the impact of breastfeeding on the development of the infant gut and nasal microbiomes in a cohort of Black infants in Washington, DC.

**Methods:** We enrolled 44 Black newborns and their mothers, and collected feeding, health, and demographic data. We collected rectal and nasal swab specimens from infants at <15 days, 1 month, and 4 months and nasal swab specimens from mothers at the same time points, for 16S rRNA sequencing. Analyses compared gut and nasal microbiome composition over time by delivery mode and breastfeeding status using a linear mixed effects model.

**Results:** The highest percentage of beneficial gut bacteria (*Lactobacillus* and *Bifidobacterium*) was found in exclusively breastfed infants followed by mixed-fed (breastmilk and formula) and formula fed infants at each time point. Gut samples showed a significantly higher proportional abundance of beneficial bacteria for vaginal compared to cesarean delivery ( $p=.01$ ). Beneficial bacteria were also higher for exclusive breastfeeding ( $p=.002$ ) and mixed feeding ( $p=.06$ ) compared to formula feeding. Preliminary results for nasal samples showed potential decreases in beneficial nasal bacteria (*Dolosigranulum*) among formula fed infants, though there were weaker and fewer significant associations between feed and nasal taxa.

**Conclusions:** Findings demonstrate the effects of cesarean birth on early infant gut microbiome composition and the positive impacts of breastfeeding on shaping the gut and nasal microbiomes over time. These results underscore the importance of breastfeeding promotion in this unique group of minoritized infants. These results also contribute to emerging research of how breastfeeding and vaginal birth might positively influence development of the nasal microbiome in infants.

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# **GWSPH RESEARCH SHOWCASE**

# **ENVIRONMENTAL AND**

# **OCCUPATIONAL HEALTH**

## **Human Chemical Exposure Through Flood Waters Following Extreme Precipitation Events: A Systematic Review**

*Background:* Flooding events often occur after precipitation events. With increased effects of climate change, precipitation events are becoming more frequent and more severe, thus leading to increased exposure of humans to flood waters. Flood waters can move toxic products, such as chemicals through a community thereby resulting in human exposure.

*Objectives:* We looked to conduct a systematic review to consider the effect of flood water exposure due to extreme precipitation events on chemical exposures experienced by humans.

*Methods:* We utilized the Navigation Guide framework to conduct a systematic review with a search spanning three databases in order to determine the quality and strength of the evidence of the current literature on floodwaters and chemical exposures.

*Results:* We found 15 relevant papers to include in the review, and four of which were deemed to be of high quality and high strength. The papers were mixed in their findings. 13 papers found some increased chemical exposures with flood water exposure, while six papers found no significant change among some chemicals, and one paper found an improvement in chemical concentration following flooding.

*Discussion:* Future research is integral to be able to measure soil chemical concentrations prior and following floodwaters moving through an area following an extreme precipitation event. As the effects of climate change are continued to be felt, it is imperative that we are able to understand the types of chemical exposures humans are being exposed to through flood waters so that we can better prepare and mitigate future events.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Desert Locust Plagues and Malnutrition in Low-Resource Settings: A Systematic Review

**Background:** Desert Locusts (*Schistocerca gregaria*) outbreaks are detrimental to crop yield and therefore food security in many low- and middle- income countries (LMICs).

**Objectives:** We conducted a systematic review to determine whether exposure to outbreaks of desert locusts contributes to malnutrition in LMICs.

**Methods:** We searched PubMed, Web of Science, and Scopus for original studies that quantified exposures to desert locust outbreaks in LMICs and their impact on undernutrition published up to 1 October 2024. We evaluated the risk of bias of individual studies and determined the overall quality and strength of the evidence according to the Navigation Guide Framework described by Johnson et al. (2014).

**Results:** Six studies met the inclusion criteria and included data from 39 countries with exposure windows ranging from 1985 to 2018. The risk of bias across the studies varied, but generally 76% of the bias categories applicable were ranked as “low” to “probably low” risk. We concluded that the overall body of evidence was of “moderate” quality with “limited” evidence for an association between desert locust exposure and malnutrition. While all studies demonstrated statistically significant positive associations of undernutrition indicators and utilized mixed-effect models to test for covariates, chance, bias, and confounding could not be ruled out with reasonable confidence.

**Discussion:** To improve the quality of the body of evidence, future research should expand to underrepresented regions and age groups, better account for external variables which might impact study results and include longitudinal studies to better understand the long-term effects repeated locust exposure has on vulnerable populations.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Uranium Mining Activities and Waste and its Health Implications to Neighboring Communities: A Systematic Review

**Background:** Uranium mining and waste activities have been shown to induce negative health outcomes, including cancer, in human populations. While a greater focus has been on those occupationally exposed to uranium mining activities, neighboring communities are also affected; yet, no systematic reviews have been conducted to elucidate the relation between community-based exposures to uranium mining and waste and health outcomes.

**Objectives:** Through the Navigation Guide’s methodology, I conducted a systematic review to answer the question, “Do uranium mining activities and waste increase the prevalence of and likelihood of developing acute and chronic health conditions for people living in communities near mining activities?” and rated the strength of evidence included in this review.

**Methods:** Following the guidance of the Navigation Guide, I identified relevant literature from three databases and selected studies based on strict inclusion criteria. I analyzed the risk of bias, the quality of evidence, and strength of evidence of the studies included in this review.

**Discussion:** I selected eleven studies and examined the acute and chronic health conditions resulting from active and legacy exposure to uranium mining activities and waste. The evidence suggests that community exposure to uranium mining activities and waste increased the prevalence of and likelihood of developing acute and chronic health conditions. The included studies were limited to specific locations and likely community exposure pathways were inhalation and ingestion.

**Conclusion:** After applying the Navigation Guide’s methodology, I conclude that there is “sufficient” evidence of an increase in prevalence of and likelihood of developing acute and chronic health conditions in communities residing near uranium mining activities and waste

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Combined sewer overflows and gastrointestinal illness in the Urban US: A Systematic Review

**Background:** In the United States, aging water infrastructure that results in Combined Sewer Overflow (CSO) may be putting populations at risk for gastrointestinal illness.

**Objective:** I conducted a systematic literature review regarding exposure to CSOs and gastrointestinal illness in urban areas of the United States.

**Methods:** I included articles based in the United States and articles that quantified CSOs as an exposure and gastrointestinal illness in humans as a health outcome. I evaluated the risk of bias of individual studies and the overall quality and strength of the evidence according to the Navigation Guide methodology for systematic reviews.

**Results:** Six articles met the inclusion criteria and were analyzed in this review. Included study periods ranged from 2002 – 2019. The six included studies encompassed six different urban areas of the United States. All studies reported a small, positive association between exposure to CSOs and gastrointestinal illness. However, the overall body of literature is challenged with risk of bias due to confounding and exposure assessment methods. Following the Navigation Guide methodology, the quality of the body of evidence was rated as *moderate* and the strength of the body of evidence was rated as *limited*.

**Conclusion:** Future studies should attempt to quantify and strengthen knowledge regarding the exposure pathway relationship between exposure to CSOs and gastrointestinal illness.

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# GWSPH RESEARCH SHOWCASE

# ENVIRONMENTAL AND

# OCCUPATIONAL HEALTH

## Detection and Quantification of Influenza A and Influenza B RNA Following Administration of Live Attenuated Influenza Virus Vaccine in a Large Adult Population

**Background:** Influenza virus causes millions of illnesses and hundreds of thousands of deaths each year, placing the virus as a significant global health concern. There are currently two forms of the influenza vaccine that are available, the injectable inactivated influenza vaccine and the nasal spray live attenuated influenza vaccine (LAIV). The live attenuated vaccine has been extensively studied in adolescent populations, but little is known in adult populations. Our research thus far has focused on detecting and quantifying influenza A and influenza B RNA from nasal swabs collected from a large adult population enrolled in our LAIV study.

**Methods:** Our team conducted a longitudinal study to collect samples at three visits one week post administration of LAIV to detect and quantify influenza A and influenza B RNA from nasal swab samples. Our study was separated into two cohorts, the year 1 cohort was enrolled in 2023 (n=111) and the year 2 cohort was enrolled in 2024 (n=179). Thus far, RNA has been extracted from nasal swab samples from our year 1 cohort (n=317), and real-time reverse transcriptase quantitative polymerase chain reaction was used to detect and quantify influenza A and influenza B RNA. All analyses were conducted in SAS version 9.4.

**Results:** Detection of any virus was 92.7%, with Flu B having comparatively higher detection compared with Flu A (92.7% vs. 53.9%). This is in line with prior studies that have also observed differential detection. We also observe a consistent decrease in influenza A detection at three visits in the week following vaccination (51.0%, 11.2%, 2.0%). This pattern was also observed for influenza B (90.4%, 61.7%, 16.7%). We also observed a decrease in median density at three visits for both influenza A (4.02 log<sub>10</sub> copies/mL, 0 log<sub>10</sub> copies/mL, 0 log<sub>10</sub> copies/mL) and influenza B (4.41 log<sub>10</sub> copies/mL, 3.84 log<sub>10</sub> copies/mL, 0 log<sub>10</sub> copies/mL).

**Conclusion:** Our results thus far have characterized the detection rates and density of influenza A and influenza B after administration of LAIV in a large adult population. Our study design provides an advantage over previous studies by providing a higher temporal resolution, and therefore better characterization of the replication dynamics of LAIV strains in an adult population following administration of LAIV. These results provide an important basis for planned future analyses that will investigate the interaction between the adult nasal microbiome and immune environment, and risk of influenza infection.

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# Epidemiology

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# GWSPH RESEARCH SHOWCASE

## EPIDEMIOLOGY

### Baseline Pain Phenotyping and Associated Factors in Chronic Chikungunya Arthritis: A Cross-Sectional Study

**Background:** Chronic chikungunya arthritis (CCA), a debilitating complication of chikungunya virus infection, is marked by persistent joint pain and impaired quality of life. Despite its clinical impact, pain phenotyping—particularly the differentiation between nociceptive, neuropathic, and nociplastic pain—remains understudied in CCA. Furthermore, the role of social determinants of health (SDOH) in shaping pain experiences in this population is poorly understood. This study aimed to characterize pain phenotypes in CCA and explore their associations with clinical, demographic, and social variables.

**Methods:** a cross-sectional analysis was conducted utilizing data from a Colombian cohort of 117 CCA patients. Pain phenotypes were classified using the PainDETECT Questionnaire (neuropathic pain) and the Nociplastic-based Fibromyalgia Features (NFF) scale. Clinical assessments included the CHIK-DAS (Chikungunya Disease Activity Score), Health Assessment Questionnaire (HAQ), and Arthritis flare scores. The social determinants of Health (SDOH) evaluated included medication access, transportation, food security, and income reliability. Bivariate analyses using chi-square and Wilcoxon rank-sum tests compared clinical and social characteristics across pain phenotypes.

**Results:** Mixed neuropathic and nociplastic pain was the most frequent phenotype (45.3%), followed by isolated nociplastic pain (22.2%), nociceptive pain (13.7%), and mixed nociceptive/nociplastic pain (12.0%). Neuropathic and nociplastic pain components were associated with higher CHIK-DAS, HAQ, and Arthritis flare scores ( $p < 0.01$ ), indicating more severe disease activity and functional impairment. Sleep disturbance was more prevalent in individuals with neuropathic ( $p = 0.0225$ ) and nociplastic ( $p = 0.0007$ ) pain. Neuropathic pain showed significant associations with transportation barriers ( $p = 0.0164$ ), income reliability ( $p = 0.0261$ ), and medication security ( $p = 0.0005$ ). Nociceptive pain was associated with lower disease activity and better functional scores, while nociplastic pain was linked to longer pain duration ( $p = 0.0051$ ) but showed no significant associations with SDOH.

**Conclusions:** Pain in chronic chikungunya arthritis is multifactorial, with overlapping neuropathic and nociplastic components being the most common. These phenotypes are associated with greater clinical severity and, in the case of neuropathic pain, with socioeconomic vulnerabilities. In contrast, nociceptive pain reflects milder disease activity. These findings underscore the need for individualized pain assessment and management strategies in CCA that account for both clinical presentation and social context.

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# GWSPH RESEARCH SHOWCASE

## EPIDEMIOLOGY

### Identifying Medicare provider characteristics associated with timely dementia diagnosis

**Background:** Late or missed diagnosis of dementia is common. Research in other areas of healthcare has shown that provider characteristics such as gender can influence patient-provider interactions above the influence of patient characteristics alone. Increased specialization and decreasing patient-provider relationships may also contribute, given clinical recognition of cognitive decline over time is needed for dementia diagnosis. Identifying characteristics of providers that predict timely dementia diagnoses over and above patient characteristics is crucial to addressing disparities in diagnosis, care, and treatment, particularly as new and better treatments for dementia come to market. We aim to identify provider characteristics associated with timely dementia diagnosis.

**Methods:** We used data from 5 harmonized cohorts from the Rush Alzheimer's Disease Center (RADCC), linked Medicare fee-for-service claims data, and the National Plan and Provider Enumeration System (NPPES) database. In this preliminary work, we examined whether provider gender, patient-provider gender concordance, or provider specialty were associated with timely dementia diagnosis among those with cohort-determined dementia using univariate logistic regression.

**Results:** In our preliminary analysis, we identified 516 participants with cohort-determined dementia; 385 received a timely diagnosis of dementia and 131 received a late diagnosis in the healthcare setting, determined via linkage to Medicare claims. We did not find any significant associations between provider characteristics and timely diagnosis: male provider gender (OR: 0.84, 95% CI: 0.63, 1.15); patient-provider gender concordance (OR: 1.11, 95% CI: 0.81, 1.50); or specialty of primary care (OR: 0.95, 95% CI: 0.70, 1.27), gerontology (OR: 1.53, 95% CI: 0.51, 4.62), or cardiology (OR: 1.20, 95% CI: 0.64, 2.28).

**Discussion:** The provider characteristics investigated in this preliminary analysis do not appear to be central to timely dementia diagnosis, although these findings may change when explored in a larger sample. Expanded analyses will include additional provider characteristics and adjustment for patient characteristics known to be associated with timely diagnosis of dementia.

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# GWSPH RESEARCH SHOWCASE

## EPIDEMIOLOGY

### Sociobehavioral research in Puerto Rico: A critical review

**Introduction:** Puerto Rico (PR) is a jurisdiction that contributes to a significant number of new HIV infections in the US, particularly among Latinxs, and it is part of the Caribbean region, an area heavily affected by HIV. Despite significant research contributions addressing the HIV epidemic in PR, there is a limited comprehensive assessment of the overall body of work. This limits integrating scientific evidence into effective culturally congruent interventions.

**Methods:** We systematically reviewed four databases for peer-reviewed literature about socio-behavioral HIV research in PR published from the beginning of the epidemic (1980s-90s) until October 2024. Publications were included if they addressed HIV social-behavioral research with humans in PR, irrespective of the study population, language, or study design.

**Results:** The critical review included 217 articles, most published in the early 2000s and focused on data collected in PR. More than 25% of the publications focused on people with HIV (PWH), used quantitative research methods (56%), and addressed risk factors (>50%). Prominent research has been conducted on HIV stigma, vertical HIV transmission, people who inject drugs, and cancer-related factors among PWH.

**Discussion:** Contributions have been made to studying interventions with healthcare providers, students, and mentors. Limited publications are addressing pre-exposure prophylaxis, post-exposure prophylaxis, and implementation science. A few articles cover clinical trials, several of which include PR as a site, but no data analysis was relevant to the local HIV epidemic. More intervention research and research focused on sexual and gender minorities and other key populations (e.g., sex workers, justice-involved) is needed. Studies have changed over time to respond to prioritized topics/populations, use of language, and emerging HIV services and research methods.

**Conclusions:** Despite significant structural barriers, HIV research in PR has advanced the understanding of the social and structural factors influencing HIV outcomes. However, it is necessary to enhance the in-depth examination of the gaps to address the needs of key populations, including PWH. Intervention and implementation science research is scarce. There is a need for diversity research funding to conduct culturally congruent studies and support local scientists. This is the first comprehensive review of HIV research exclusively focused on PR. Findings may provide insights into conducting HIV research in resource-limited jurisdictions and enhance the work that has led to contributions in response to the HIV epidemic in PR, among Latinxs/Hispanics, and elsewhere.

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# GWSPH RESEARCH SHOWCASE

## EPIDEMIOLOGY

### Relation of Neuropathologies to Timely Diagnosis of Dementia in Healthcare Settings

**Background:** Multiple brain pathologies contribute to dementia. It remains unknown if certain neuropathologies are associated with susceptibility to diagnostic delays in dementia; delays are common and may result in missed opportunities for treatment and support. This study investigates relationships between presence of specific neuropathologies and timeliness of dementia diagnosis in healthcare settings.

**Methods:** Using five cohorts at Rush Alzheimer's Disease Center, we selected participants who had incident dementia based on annual cohort assessments, linkage to Medicare records, and later had postmortem brain autopsy.

Neuropathologic examinations identified presence of Alzheimer's disease (AD), Limbic-predominant age-related TDP-43 encephalopathy neuropathologic change (LATE-NC), vascular, and Lewy bodies (LB) pathologies. In linked Medicare data, we defined timely dementia diagnoses as claims diagnoses received within 3 years prior to or 1 year after cohort dementia onset. We used logistic regression to assess associations of pathology with timely diagnosis versus underdiagnosis.

**Results:** Among 500 participants (29% male, 95% non-Latino White, mean[SD] age at dementia onset= 87.6[6.6] years, mean[SD] years from dementia onset to death= 3.8[3.2]), only 54% received a timely diagnosis in the healthcare settings. Adjusting for demographics, other pathologies, and time to death, we found AD (OR= 1.91, 95% CI= 1.21-3.00) and LATE-NC pathologies (OR= 1.83, 95% CI= 1.25-2.68) were independently associated with higher odds of timely diagnosis. Vascular (OR=0.94, 95% CI= 0.55-1.59) and LB pathologies (OR= 1.00, 95% CI= 0.64-1.55) were not significantly associated with timely diagnosis.

**Conclusion:** In deceased older adults with incident dementia, the healthcare system was twice as likely to capture those with AD and LATE-NC pathologies in a timely manner. The reasons for this are unknown but may be related to differences in clinical manifestations. These findings provide some reassurance that those with AD pathology may be recognized in a timely window, which is believed to be necessary for effectively treating AD. The lack of association between vascular pathology and timely diagnosis may be concerning, given that treatments to improve vascular health (e.g. blood pressure control) can reduce cognitive impairment.

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# GWSPH RESEARCH SHOWCASE

## EPIDEMIOLOGY

### The Association between Meeting Physical Activity Guidelines and Anxiety Following the Covid-19 Pandemic; NHIS, 2020 and 2022

**Background:** The Covid-19 pandemic had a significant impact on anxiety worldwide. Although research prior to and during the pandemic highlights the role physical activity plays in mediating the risk of anxiety, it is unclear how meeting physical activity guidelines is associated with anxiety among a US population following the Covid-19 pandemic. We examined this association among a nationally representative US adult population.

**Methods:** The National Health Interview Survey (NHIS) is a surveillance tool that obtains health data from the US population annually. Self-reported data on anxiety symptoms were collected from 2020 and 2022 to assess how the prevalence of anxiety among US adults changed from the early phase (2020) to the late phase (2022) of the pandemic. Physical activity guideline data were collected from the 2022 survey. Specifically, 1) meeting aerobic guidelines only (i.e., at least 150 min aerobic activity/week); 2) meeting muscle strengthening guidelines only (2 or more strength training sessions/week); 3) meeting both aerobic and muscle strengthening guidelines; and 4) meeting neither (referent). Logistic regression analyses were conducted to determine the association between meeting physical activity guidelines in 2022 and self-reported anxiety in 2022. Potential sex-differences were also evaluated.

**Results:** The prevalence of anxiety significantly increased from 15.1% (95% CI: 14.6-15.7) in 2020 to 17.8% (95% CI: 17.2-18.4%) in 2022. Participants who reported sufficient amounts of aerobic activity (at least 150 min/week) had 40% lower odds of anxiety (aPOR: 0.60 [95% CI: 0.54-0.66]) compared with those who did not. Those who met both aerobic and strengthening guidelines had a 39% lower odds of reporting anxiety (aPOR: 0.61 [95% CI: 0.54 – 0.68]) compared with those who met neither. Meeting the aerobic guidelines alone lowered the prevalence odds of anxiety by 23% compared to meeting neither guideline (aPOR: 0.77 [95% CI: 0.70-0.86]); however, meeting only the strengthening guidelines had no effect on reported anxiety. We observed no effect modification by sex.

**Significance:** This study highlights the long-term psychological effects of the Covid-19 pandemic among a nationally representative US adult population. Meeting aerobic physical activity guidelines had a significant impact on decreasing the prevalence odds of anxiety. Resources to promote meeting aerobic guidelines may serve as a critical intervention strategy to aid in decreasing the burden of anxiety in the US following the Covid-19 pandemic.

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## GWSPH RESEARCH SHOWCASE

# EPIDEMIOLOGY

### Cardiopulmonary exercise testing in bipolar and major depressive disorders: Preliminary physical performance and pre-post mood change

**Background:** Exercise has demonstrated benefits in depression broadly as well as major depressive disorder (MDD), suggesting it may be helpful in bipolar disorder (BD) – both to promote mental wellbeing and prevent downstream medical morbidity (e.g., cardiovascular disease) that is known to be starkly higher in BD. Current exercise recommendations for individuals with BD have largely been generalized from studies of major depressive disorder (MDD). However, a key difference between BD and MDD is the presence of impairing elevation of the affective system—emotion, activity, and cognition—in BD in addition to depressions that are common to both conditions. Additional research is needed to assess the impact of exercise on mood and inform optimal recommendations for those with BD.

**Purpose:** The Mood-CPET study aims to 1) demonstrate feasibility of enrolling, conducting research psychiatric diagnostic interviews remotely, and safely completing cardiopulmonary exercise testing (CPET) in adults with BD or MDD, and 2) compare CPET performance, correlates, and pre-post CPET mood change between BD and MDD participants. Here, we report on preliminary physical performance and pre-post-CPET mood change among study participants completing CPET as of February 5, 2025.

**Methods:** Adults with BD or MDD were recruited from the Washington, DC area with diagnoses ascertained remotely via the Mini International Neuropsychiatric Interview (MINI) 7.0 for DSM-5 by a trained research nurse. Participants completed an onsite, treadmill-based CPET to volitional exhaustion via the modified Bruce protocol. Participants self-reported momentary affective state immediately prior to and post-CPET, including sadness, anxiety, activation, energy, distraction, irritability, slow thinking, inability to enjoy/feel pleasure, and restlessness, on Likert-type scales rated from 1-7.

**Results:** Of 27 individuals pre-screened, 25 were enrolled; 13 completed onsite assessments as of February 5, 2025 (mean age 26.8 years, 85% female, 62% White). Average CPET time was  $15.7 \pm 2.5$  min., with peak  $\text{VO}_2$   $33.9 \pm 9.2$  ml/kg/min. Participating in CPET was associated, on average, with a reduction in anxiety (-.46), distraction (-.77), irritability (-.62), and restlessness (-.62); increased active (1.92) and energetic (1.31) feelings, ability to enjoy/feel pleasure (.31), and slowing down of thoughts (.38); and was neutral with respect to sad-happy valence.

**Conclusion:** Enrolling, conducting diagnostic interviews, and safely completing CPET in adults with BD or MDD appears feasible; moreover, peak CPET variables were aligned with age and sex-based norms. Findings overall demonstrate improvement in a broad range of affective states linked to a single bout of high-intensity exercise in persons with mood disorders.

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# GWSPH RESEARCH SHOWCASE

## EPIDEMIOLOGY

### Progestin-Only vs. Combination Contraceptives: Examining Associations with Depression in a Cross- Sectional Analysis

**Background:** Many studies have examined the association between hormonal contraception and depression; however, findings remain inconsistent. Newer research suggests that inconsistent conclusions may be due to different effects on mood based on hormonal composition of the contraceptive and specific subpopulations at greater risk.

**Purpose:** This study seeks to examine specific effects of progesterone-only and combined progesterone-estrogen contraceptives on depression, and whether this relationship is moderated by concurrent antidepressant use or age. It will also use surveillance data to examine whether depression events are more commonly reported with use of certain classes of contraceptives compared to others.

**Methods:** NHANES questionnaires from 2017-2020 were used to determine contraceptive type from drug prescription information and binary presence of depression symptoms from a nine-question screener. Logistic regression models were run and adjusted and unadjusted odds ratios were calculated. FAERS surveillance data was used to compare depression reporting ratios in each class of contraceptives.

**Results:** Women using progestin-only contraceptives had significantly higher odds of depression compared to women not taking any hormonal contraceptives (aOR=2.9 [1.1, 7.5]). Overall and combination contraceptive use were not significant predictors of depression. Disproportionality analyses revealed no significant overall differences in depression adverse event reports between combination and progestin-only contraceptives; however, medroxyprogesterone acetate had a higher proportion of depression reports compared to all combination contraceptives (ROR=1.46 [1.26, 1.69]).

**Conclusion:** This study revealed different associations with depression based on the hormonal composition of contraceptives and suggests that progestin-only contraceptives may be associated with higher odds of depression compared to women not taking hormonal contraception. While there are limitations in this cross-sectional study, findings highlight the importance of considering the composition of contraceptives when evaluating mental health effects. This finding may provide insights for both healthcare providers and patients in making informed contraceptive choices. Future research should explore associations with specific progestins, dose, and routes of administration.

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# GWSPH RESEARCH SHOWCASE

## EPIDEMIOLOGY

### Vape Master and Other Apps: An Analysis of E-Cigarette Gaming and Simulator Mobile Apps

**Background & Significance:** The Apple “App Store” and the Google “Play Store” are two major platforms for downloading digital applications (apps). Electronic cigarette (e-cigarette) related apps are available on these platforms, which can promote products and attract new users. These apps commonly feature youth-oriented characteristics such as animated or youthful characters, and vibrant colors. The combination of e-cigarette apps appealing to youth and glamorizing nicotine use is concerning given the number of smartphones among youth. Both platforms have policies limiting tobacco use in apps, however enforcement is not consistent.

**Purpose:** This study catalogs the types of e-cigarette-related apps available on the App Store and Play Store and examines youth-oriented content in simulator and gaming e-cigarette apps.

**Methods:** Using Python, 41 e-cigarette-related terms were searched in the Apple App Store and Google Play Store. Two coders assessed app metadata for relevance to e-cigarettes and categorized them by genre, identifying 33 gaming and simulator apps. Using a codebook, the store listings (n=18) and recorded live-playing content (n=28) of these apps were coded for youth-oriented themes.

**Findings & Conclusions:** Both platforms had e-cigarette-related apps (Apple App Store: 42; Google Play Store: 73). However, simulator and gaming apps were only found on the Google Play store. These apps contained thematic youth-appealing elements such as violence (n=13) and vibrant colors (n=25). Tobacco ads with youth appealing features are regulated in broadcast and print media, but not in mobile apps. While Apple has removed much of the content from its App Store, the Google Play Store continues to house e-cigarette apps with youth-appealing characteristics. App platforms are left to self-regulate e-cigarette content.

**Implications:** E-cigarette related simulator and gaming apps on the Google Play Store are downloaded by millions of devices and are easily accessible to youth. These apps contain youth-appealing features that have the potential to romanticize and normalize e-cigarette use.

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# GWSPH RESEARCH SHOWCASE

## EPIDEMIOLOGY

### Cervical Cancer Screening Guideline Concordance among Sexual Minority Females in the 2019, 2021, and 2023 National Health Interview Survey (NHIS)

**Background:** In 2025, an estimated 13,360 cases of cervical cancer and 4,320 related deaths are expected in the U.S. While incidence and mortality have declined due to HPV vaccination and screening, these trends have plateaued or reversed in certain age and minority groups. Sexual minority females (SMF) are at risk of developing cervical cancer but are less likely to receive screening and face unique barriers to care.

**Purpose:** Existing studies on SMF and screening are often not nationally representative and focus on lifetime screening rather than adherence to guidelines. The impact of the COVID-19 pandemic on screening in this population is also underexplored. This analysis used nationally representative data to examine trends in guideline-concordant cervical cancer screening among SMF and to identify factors associated with screening adherence.

**Methods:** We analyzed 2019, 2021, and 2023 National Health Interview Survey (NHIS) data, including participants aged 21-65 who identified their sex as female, had not had a hysterectomy, and reported sexual orientation and screening history. SMF included those identifying as Gay/Lesbian, Bisexual, or Something Else. Screening was guideline concordant if reported in the last 3 years (ages 21-29) or 5 years (ages 30-65). Age-adjusted prevalence of guideline concordance (GC) was estimated by year and sexual orientation. Logistic regression models were used to identify predictors of GC among SMF and to estimate associations between sexual orientation and GC overall.

**Findings:** Across the 2019, 2021, and 2023 NHIS, age-adjusted prevalence of GC significantly declined (2019: 81.63%; 2023: 77.49%). GC was consistently lower among SMF versus non-SMF (69.62% vs. 77.96% in 2023), though the decline in GC over time was not statistically significant for SMF. Age, education, and recent live birth predicted GC among SMF. SMF had lower odds of GC (OR 0.75, 95% CI 0.65-0.88), with the lowest odds among those identifying as Gay/Lesbian (OR 0.60, 95% CI 0.47-0.77). Disparities were largest in younger SMF, those with higher education, and those with health insurance.

**Discussion:** While a decline in GC was expected during the COVID-19 pandemic, continued decreases in 2023 suggest ongoing barriers to care. Disparities among SMF, especially those identifying as Gay/Lesbian, are concerning and may reflect differences in care access, clinical experiences, or screening perceptions. Targeted interventions are needed to address these disparities, along with further research into the role of gender identity in screening behaviors. In a political climate increasingly hostile to LGBTQ+ communities, protecting access to inclusive gynecologic care is crucial.

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# GWSPH RESEARCH SHOWCASE

## EPIDEMIOLOGY

### Impact of Gender-Affirming Hormone Therapy on HIV Infectivity to Peripheral Blood Mononuclear Cells from Transgender Women

**Background:** Transgender women (TW) experience disproportionately high HIV rates and increased risk of HIV acquisition compared to cisgender men. The biological mechanisms underlying this disparity, including the role of exogenous estradiol (E2) in gender-affirming hormonal therapy (GAHT), remain unclear. HIV infectivity in peripheral blood mononuclear cells (PBMCs) varies across individuals due to biological and hormonal factors. This study investigates whether sex hormone levels- estradiol (E2), testosterone (T), and progesterone (P4) are associated with HIV infection in PBMCs, which represent a crucial model for studying HIV infection dynamics. Understanding the interplay between sex hormones and immune function in HIV infection could provide insight into biological factors contributing to HIV risk in TW.

**Methods:** We recruited 36 assigned males at birth (AMAB) participants who are HIV-negative, sexually active and not on pre-exposure prophylaxis (PrEP) from the Washington Metro area. Cohort 1 (n=7) included TW with no history of GAHT (visit-1) and after three months on GAHT (visit-2); cohort 2 (n=22) included TW on GAHT for  $\geq 6$  months, and cohort 3 (n=7) were cisgender men with no GAHT exposure. PBMCs were isolated from blood and assessed in-vitro to measure HIV infectivity by GagP24 ELISA (n=34) using samples of day 3 to day 7 post infection (dpi). E2, P4 and T levels in plasma samples were measured by ELISA (DRG International). Statistical analysis compared GagP24 levels among cohorts and their association with sex hormones using Mann Whitney t test, Kruskal Wallis test, Spearman Correlation. (SAS 9.4).

**Results:** HIV infection of PBMC after 6 days dpi showed marginally significant differences between cohort 1 and 2 ( $p = 0.0580$ ). Regarding hormonal association with HIV infectivity for cohort 1 (visit-1), both T ( $\rho = -0.89$ ,  $p = 0.0188$ ) and P4 ( $\rho = -0.83$ ,  $p = 0.0416$ ) showed significant negative correlations with HIV infectivity. In cohort 2, E2 showed a moderate non-significant negative correlation with HIV infection ( $\rho = -0.33$ ,  $p = 0.0998$ ).

**Conclusion:** The analysis of HIV infection of PBMCs over 7 dpi revealed significant differences across the cohorts, suggesting GAHT may influence infectivity. These findings support the potential role of sex hormones in modulating HIV infection in TW on GAHT, warranting further research to elucidate mechanisms of HIV pathogenesis in this population.

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## **GWSPH RESEARCH SHOWCASE EPIDEMIOLOGY**

### **Developing Machine Learning Models to Predict Adherence to Cervical Cancer Screening Guidelines Among Transgender and Non-Binary People**

In addition to experiencing discrimination in gynecological environments, transgender and non-binary people are more likely to have sociodemographic factors that put them at risk for being behind on their cervical cancer screening compared to cisgender women. Using data from the 2014, 2016, 2018, 2020, and 2022 Behavioral Risk Factor Surveillance System (BRFSS) surveys, this study assessed the predictive power of sociodemographic factors, including race/ethnicity, age, education, insurance status, income, BMI, smoking status, mental health status, marital status, sexual orientation, number of chronic health conditions, and access to regular healthcare, in classifying the cervical cancer screening adherence status of transgender and non-binary participants. Logistic regression, Naïve Bayes, Classification Tree, Random Forest, and Gradient Boosted Tree models were conducted. Accuracy for the machine learning models ranged from 56.76% to 68.38%, sensitivity from 53.11% to 81.59%, specificity from 47.71% to 74.03%, and Area Under Curve (AUC) from 0.6463 to 0.7194. Age, healthcare access, mental health, race, Body Mass Index (BMI), and sexual orientation consistently emerged as important variables in reducing the models' error rates. Across models, participants with regular healthcare access, Non-Hispanic White participants compared to Non-Hispanic Black participants, and straight participants compared to lesbian or gay participants were more likely to be classified as adherent. Sociodemographic variables have moderate predictive ability for discerning participants' adherence classification and more research needs to be conducted to better predict and address transgender and nonbinary people's barriers to cervical cancer screening.

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# GWSPH RESEARCH SHOWCASE EPIDEMIOLOGY

## The Interaction Between BMI and Physical Activity Guidelines on Cancer Odds: An Analysis of NHIS 2022 Data

**Background:** Physical activity (PA) has been linked to reduced cancer risk, but the modifying effect of body mass index (BMI) remains unclear. This study examines the association between 2018 Physical Activity Guidelines adherence and cancer risk, assessing BMI effect modification and demographic disparities.

**Methods:** This cross-sectional study analyzed 2022 National Health Interview Survey data from adults aged 18+ (N=26,465) with cancer status, PA levels, BMI, and demographic information. Logistic regression models estimated adjusted odds ratios (AORs) for cancer diagnosis, with further investigation of the interaction term between physical activity adherence status and BMI to assess effect modification.

**(Preliminary) Results:** Bivariate analysis revealed meeting both aerobic and strength guidelines was significantly associated with lower cancer odds ( $\beta = -0.5058$ ,  $p < 0.0001$ ). In Table 3, males showed lower cancer odds than females (AOR=0.854, 95% CI: 0.777-0.939), and Non-Hispanic Black, Hispanic, and Asian individuals had substantially lower cancer odds compared to Non-Hispanic Whites. Higher education was associated with increased cancer risk (AOR=1.407, 95% CI: 1.264-1.566). A marginally significant interaction between BMI and PA adherence was observed ( $p = 0.0751$ ), warranting stratified analysis. This revealed overweight individuals meeting both aerobic and strength guidelines had significantly lower cancer odds (AOR=0.751, 95% CI: 0.606-0.932), while no significant associations emerged for other BMI categories.

**Conclusions:** This comprehensive analytical approach revealed important nuances in the association between physical activity guideline adherence and cancer risk. The protective effect of meeting both aerobic and strength guidelines appear to be BMI-dependent, with significant benefits predominantly observed among overweight individuals. These findings suggest the potential efficacy of targeted physical activity interventions specifically for overweight populations. Significant racial/ethnic differences were observed, with Non-Hispanic Black, Hispanic, and Asian individuals demonstrating substantially lower cancer odds compared to Non-Hispanic Whites. Future investigations should explore the biological and behavioral mechanisms underlying these differential associations across BMI categories and demographic subpopulations, with a particular focus on how metabolic, inflammatory, and lifestyle factors influence cancer risk.

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## GWSPH RESEARCH SHOWCASE

# EPIDEMIOLOGY

### Healthcare Costs and Utilization Patterns Before and After Dementia Onset With and Without Timely Clinical Recognition by the Healthcare System

**Background:** Prior research has shown substantial underdiagnosis of dementia in healthcare settings, as well as an increase in healthcare utilization and costs around the time of clinical dementia diagnosis. However, patterns around the onset of dementia—independent of clinical dementia diagnosis—remain poorly understood. This study examines healthcare utilization and costs around dementia onset among those with and without clinical recognition.

**Methods:** Participants were from five Rush Alzheimer's Disease Center (RADC) cohorts. Healthcare costs and utilization data were extracted from linkage to Medicare fee-for-service claims, covering the period from three years before to one year after cohort-determined dementia onset. Outcomes include total and category-specific Medicare payments (Parts A and B), emergency department (ED) visits, outpatient provider interactions, and hospitalizations. We analysed four-year healthcare utilization trajectories, from before to after dementia onset. We also identified whether persons with cohort-determined dementia had a dementia diagnosis recorded in Medicare claims within the four-year window and examined differences in healthcare utilization and cost according to clinical recognition of dementia.

**Results:** Among 520 participants, the median age at dementia onset was 87 years, 73% were female, and 88% identified as non-Hispanic White. Inpatient and outpatient costs, outpatient provider interactions, and hospitalizations increased leading up to and during the year of dementia onset, then declined in the year after. Although the overall patterns were similar irrespective of clinical recognition of dementia, the 54% of persons with clinical recognition had consistently higher costs, outpatient provider interactions and hospitalization utilization.

**Conclusions:** Healthcare utilization peaks at the time of dementia onset irrespective of clinical recognition of dementia. What drives this pattern and whether observed declines after dementia onset reflect improvement in care remains unclear.

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# GWSPH RESEARCH SHOWCASE EPIDEMIOLOGY

## Sociodemographic, Clinical and Psychosocial Predictors of Short- and Long-Term Study Retention in the Diabetes Prevention Program (DPP) Outcomes Study (DPPOS)

**Introduction and Objective:** The success of longitudinal studies depends on the retention of participants. We examined sociodemographic, clinical, and psychosocial characteristics as predictors of retention among participants with prediabetes and type 2 diabetes (T2D) in the Diabetes Prevention Program (DPP) and the follow-up DPP Outcomes Study (DPPOS).

**Methods:** 3218 adults who joined the DPP (1996-1999, mean age  $51 \pm 10$  y) at high risk of T2D were randomized to a lifestyle, metformin, or placebo intervention, and then followed in the DPPOS through 2020 with lifestyle offered to all and metformin continued open label. Logistic regression models estimated the association between baseline sociodemographic, clinical and psychosocial characteristics (life events, family functioning, social support) and short-term retention (~3y during the DPP). Cox proportional hazards models, censoring at death, estimated the association between baseline and time-varying characteristics and time to drop-out over 20 years of follow-up.

**Results:** Among surviving participants, after 3 years, 93% were retained and after ~ 17 years, 76% of those surviving remained engaged. Older age was associated with short-term retention ( $p < 0.001$ ). Older age, female sex, minority race/ethnicity, full or part-time employment, and lack of baseline depressive symptoms were associated with long-term retention. Over time, better health state (SF-6D, SF-36 survey) (0.31; CI: 0.15, 0.63) was associated with retention; greater BMI (1.12; CI 1.01, 1.25), higher number of recent life events (social, personal, financial) (1.08; CI: 1.02, 1.14) and depression symptoms (Beck Depression Index) (1.02, CI: 1.01, 1.03) were associated with slightly reduced retention. Among adults 45-59 at baseline, development of T2D was associated with better retention (0.75, 0.58, 0.97).

**Conclusion:** Twenty-year retention of the majority of a racially and geographically diverse cohort with prediabetes and is possible. Retention was found to be influenced by age, psychosocial factors, T2D development, and weight change.

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# GWSPH RESEARCH SHOWCASE

## EPIDEMIOLOGY

### External Validation of Cardiovascular Disease Prognostic Tools in a Population with Type 1 Diabetes

**Background & Significance:** Various prognostic models have been developed and validated to anticipate the likelihood of developing cardiovascular disease (CVD) in the general population. These tools are intended for clinical use, allowing patients and providers to consider ways to mitigate future risk of CVD. Individuals with type 1 diabetes (T1D) are at high risk of developing CVD, however, most prognostic models have not been externally validated among a population with T1D. Although few popularized prognostic models have been endorsed for use in clinical practice among all patients at risk for CVD, including those with T1D, it is unknown whether these models accurately predict the risk of developing CVD among those with T1D.

**Methods:** We externally validated the Framingham Risk Score (FRS), ASCVD Risk Estimator Plus (ASCVD), and Steno T1 Risk Engine (ST1RE) prognostic models by assessing discrimination and calibration in a T1D population using over 40 years of data collected in the Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) study. 10-year risk windows were assessed at various time points of the DCCT/EDIC study period (e.g., 10-year risk of CVD at EDIC Year 10). Discrimination was assessed by Gönen and Heller and Uno et al.'s c-statistic. Kaplan-Meier plots visually displayed discrimination between varying risk groups for each prognostic model. Calibration was assessed using the Greenwood-Nam-D'Agostino (GND) goodness-of-fit test.

**Findings & Conclusions:** The FRS was moderately discriminant (c-statistic 0.607-0.656) at EDIC follow-up years 10, 15, and 20 (mean ages 44.34, 49.11, and 53.79, respectively), and was adequately calibrated according to the GND test ( $p > 0.05$ ). The ASCVD Risk Score underestimated the observed rate of CVD events by 49.94% at EDIC Year 10, 44.31% at EDIC Year 15, and 57.34% at EDIC Year 20, and was not well-calibrated among the DCCT/EDIC population at any time point (GND  $p < 0.05$ ). The ST1RE overestimated the observed rate of CVD events by 62.61% at EDIC Year 10, 53.78% at EDIC Year 15, and 86.17% at EDIC Year 20, and was not well-calibrated among the DCCT/EDIC population at any time point (GND  $p < 0.05$ ).

**Implications of Findings:** The FRS outperformed the other two models both in terms of discrimination and calibration among this T1D population. The ASCVD Risk Score and ST1RE should be interpreted cautiously among populations with T1D. Additional external validation among other populations with T1D is needed to confirm these results.

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# GWSPH RESEARCH SHOWCASE

## EPIDEMIOLOGY

### Enhancing Group B Streptococcus Management for Optimal Maternal and Neonatal Health Outcomes at Neighborhood Health

**Background:** Group B Streptococcus (GBS) is a leading cause of neonatal morbidity and mortality, despite well-established screening and treatment guidelines. Inadequate communication of GBS test results and delayed antibiotic administration contribute to preventable neonatal infections. This study evaluates whether implementing a patient driven intervention of photographing GBS test results improved documentation of results at delivery hospitals and increased antibiotic administration rates.

**Methods:** A prospective cohort study was conducted among 75 GBS positive pregnant individuals receiving prenatal care at Neighborhood Health clinics from January to October 2024. We compared patient cohorts before and after the intervention, assessing differences in the availability of GBS documentation at delivery hospitals and rates of intrapartum antibiotic prophylaxis (IAP). Data were obtained from electronic medical records and hospital discharge summaries. Descriptive statistics and logistic regression models were used to evaluate changes in outcome measures.

**Results:** Among 75 GBS-positive patients, documentation of GBS results at delivery increased from 51.6% before the intervention to 59.5% after implementation. Antibiotic administration rose from 53.5% to 64.3%. Patients who were informed of their GBS results were significantly more likely to receive antibiotics (65.1%) than those who were not informed (12.1%), with a statistically significant p-value ( $<0.0001$ ). The adjusted odds ratio for receiving antibiotics post-intervention was 1.6 (95% CI: 0.7–3.4).

**Conclusions:** This preliminary study found a 10% increase in antibiotic administration after the introduction of a simple, scalable intervention aimed at improving maternal and neonatal outcomes by enhancing GBS result communication. Future studies should investigate whether the intervention should be included in best practices for treating maternal GBS to ensure timely antibiotic administration and reduce neonatal infections, particularly in underserved populations.

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# GWSPH RESEARCH SHOWCASE

## EPIDEMIOLOGY

### Psychosocial Determinants of HIV Disclosure among People with HIV in Washington, DC

**Background:** Disclosure of HIV status to other individuals plays a vital role in enhancing self-care practices, promoting psychological well-being and lowering transmission risk among people with HIV (PWH). We sought to describe HIV disclosure patterns and the association between psychosocial determinants of health including social support, health literacy, internalized stigma, perceived stress, self-reported mental well-being, depressive symptoms, generalized anxiety disorders and childhood trauma and stress.

**Methods:** We utilized data from the PositiveLinks (PL) DC Cohort study. PWH receiving care in Washington, DC were enrolled in a cluster randomized controlled trial to determine the efficacy of PL, a mobile HIV care engagement platform in achieving viral suppression. We used standardized psychosocial measures (e.g., Medical Outcomes Study Social Support Survey [MOS-SSS], three-item Brief Health Literacy Screen [BHLS], Internalized HIV Stigma Scale [IHSS], Perceived Stress Scale [PSS-10], self-reported mental well-being [WHO-5 Well-Being Index], Patient Health Questionnaire [PHQ-2], Generalized Anxiety Disorder Scale [GAD-2] and Adverse Childhood Experiences [ACEs]) to assess the association between HIV disclosure and psychosocial determinants. Bivariable and multivariable logistic regressions were used to assess factors influencing disclosure.

**Results:** Among 460 participants, 88% (n=405) had disclosed their HIV status: 78% to family, 66% to friends, 54% to sexual partners. PWH aged 18-29 (7.4% vs. 16.3%,  $p = 0.047$ ) and those single or never married (55.1% vs. 72.7%,  $p = 0.004$ ) were less likely to disclose, while a higher proportion of males (59% vs 51%,  $p = 0.005$ ) disclosed their status. Participants who had disclosed their HIV status reported higher social support scores (20.64 vs. 17.40,  $p = 0.0035$ ) and higher health literacy (5.02 vs. 5.79,  $p = 0.025$ ) with lower scores indicating higher health literacy. Multivariable regressions showed social support was independently associated with disclosure status while controlling for age, gender and relationship status ( $p = 0.017$ ); health literacy was not independently associated with disclosure ( $p = 0.17$ ). Internalized stigma, perceived stress, mental well-being, depression, anxiety and ACEs were not significantly associated with disclosure.

**Conclusion:** Social support was a significant factor in HIV disclosure while lower health literacy was associated with non-disclosure. Targeted interventions to enhance social support systems and address health literacy gaps may encourage disclosure thereby leading to better individual health outcomes.

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# GWSPH RESEARCH SHOWCASE

## EPIDEMIOLOGY

### Barriers and facilitators to achieving viral suppression among people with HIV in Washington, DC

**Background:** Engagement in HIV care is crucial for achieving viral suppression and preventing HIV-related complications. Despite access to supportive services in urban areas like Washington, DC, structural and individual barriers persist and hinder HIV care engagement. This analysis aimed to identify barriers and facilitators affecting the achievement of viral suppression among people with HIV (PWH) in DC.

**Methods:** We utilized data from the PositiveLinks (PL) DC Cohort study. PWH receiving care in Washington, DC enrolled in a cluster randomized controlled trial to determine the efficacy of PL, a mobile HIV care engagement platform in achieving viral suppression (defined as HIV RNA <200 copies/ml). We analyzed participant demographics, HIV viral load, and participant-reported barriers and facilitators (e.g., structural, systems and provider-level). We performed multivariable regression to determine associations between barriers, facilitators, and viral suppression at baseline enrollment.

**Results:** A total of 444 participants were included in the analysis, of whom 14.4% were not virally suppressed. Significant barriers to viral suppression included unstable housing ( $p < 0.0001$ ), food shortages ( $p = 0.009$ ), food supply concerns ( $p = 0.006$ ), and difficulty affording household expenses ( $p = 0.001$ ). Social support, including having someone to accompany participants to appointments ( $p = 0.02$ ), and positive provider-patient relationships ( $p = 0.025$ ) were significant facilitators. Multivariable analyses showed that only lack of stable housing (aOR = 3.20;  $p = 0.003$ ), having food shortages (aOR = 0.53;  $p = 0.002$ ), food supply concern (aOR = 0.43;  $p = 0.0008$ ) and difficulty affording household expenses (aOR = 0.32;  $p = 0.0003$ ) were independently associated with viral non-suppression.

**Conclusions:** Structural barriers, particularly housing and food insecurity are obstacles to achieving viral suppression, and interventions to reduce the impact of these barriers are essential for better health outcomes in this population. Further research on enhancing social support and addressing structural factors to improve retention in HIV care and rates of viral suppression among PWH in DC is warranted.

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# Exercise and Nutrition Sciences

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Associations Between Food Insecurity and Self-Perceived Physical and Mental Health Among Urban College Students at the George Washington University

**Background:** College students are at an increased risk for food insecurity (FI) compared to the general U.S. population due to unique economic and social realities of universities. The experience of FI creates barriers to students' ability to thrive in dynamic college settings. Thus, this study investigates the relationship between persistent and episodic FI and self-perceived physical and mental health among residential students attending the George Washington University (GW).

**Methods:** A total of n=155 students completed a longitudinal online survey at three time points across the Fall 2024 semester (September, October, and December). We measured FI using the Six-Item Short Form of the USDA Household Food Security Survey Module, self-reported physical health using the CDC HRQOL-4, depression using the PHQ-2, and anxiety using the GAD-2. We summarized findings using descriptive statistics and chi-square tests.

**Results:** In our sample, 23% of students experienced FI persistently and 14% experienced FI episodically, highlighting that a total of 37% of students experienced FI at least once during the semester. Experiencing FI was associated with poorer self-reported physical health, depression, and anxiety. Of students reporting fair or poor health, 52% experienced persistent FI compared to the 27% who experienced food security ( $p<0.0001$ ). Additionally, 65% of students with depression ( $p=0.011$ ) and 49% with anxiety ( $p=0.038$ ) experienced FI at least once during the semester.

**Conclusions:** These findings highlight the negative associations between FI and student well-being, underscoring the need for continued and expanded comprehensive interventions, such as improved access to food resources and additional basic needs support.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Correlation Between Increased GLP-1 Medication Usage and Obesity Prevalence Across the Globe: A Systematic Review

**Background & Significance of the Study:** Obesity is one of the leading causes of death in the United States and is growing across the globe. Despite the global introduction of Glucagon-like peptide-1 (GLP-1) drugs, a class of medications used to treat type 2 diabetes and obesity, recent data collected from August 2021-2023, show the prevalence of obesity amongst U.S. adults to be 40.3% and data collected in 2022 show the prevalence of obesity in adults globally to be 16%. As the availability and use of GLP-1 medications continue to expand rapidly, understanding the global trends and implications for obesity are essential to informing public health policy decisions.

**The Purpose of Your Research:** This study looks to see if there is a correlation between increased GLP-1 medication use and obesity prevalence across different countries. It specifically investigates whether countries with higher GLP-1 prescription rates are experiencing more significant declines in obesity prevalence compared to those with limited availability and utilization.

**Methods:** A systematic review across databases for relevant literature was conducted to assess the prevalence of obesity across different nations over time, as well as for trends of GLP-1 prescription and usage. In addition, obesity statistics from the World Health Organization, World Obesity, the Centers for Disease Control, and international datasets such as Eurostat, were utilized to supplement these comparisons.

**Preliminary Findings & Conclusions:** Preliminary findings show that despite the introduction of GLP-1 obesity medications globally and the greatest utilization in the U.S., the U.S. still has one of the highest rates of obesity globally. The increase in prescriptions and availability of GLP-1s in high-income countries, does not yet seem to show a clear and significant impact on overall obesity prevalence rates and remains debatable. Further research is needed to determine if additional factors have a clearer influence on prevalence.

**The Implications of Findings:** The findings show that there needs to be an increased effort in data collection on GLP-1 prescription usage, to ensure that impacts on prevalence are being monitored accurately. Further research would allow to see if there is any implication on the decrease of obesity prevalence globally.

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# GWSPH RESEARCH SHOWCASE

# EXERCISE AND

# NUTRITION SCIENCES

## DC-SIPS Environmental Messaging

**Background:** Sugary drinks (SDs) including sodas, fruit drinks, sports drinks, and other sweetened beverages are the primary source of added sugar in children's diets<sup>1,2</sup> and provide little to no nutritional benefit. Despite the large body of evidence linking excessive sugary drink consumption to detrimental health outcomes, SD intake among African American youth remains well above recommended levels<sup>3</sup>. While most interventions to lower SD intake focus on their unfavorable health effects, SD consumption also has adverse impacts on the environment; however, whether youth are aware of these unfavorable environmental effects has not been studied.

**Purpose:** This study aims to examine the extent to which African American youth are concerned about the environment and how these concerns influence their perceptions and consumption of SDs. The study findings will inform development of eco-friendly messaging that aligns with community norms and values for integration into DC-SIPS, an existing intervention to lower SD intake and increase water intake among African American youth in Washington, D.C.

**Methods:** Qualitative interviews were conducted with 15 African American children aged 11–17 years old, who reported living, going to school, or seeing the doctor in Ward 8 of Washington, D.C., and habitually consuming  $\geq 12$  ounces of SDs. Each interview lasted approximately 20 minutes, during which participants were asked questions about their knowledge and concerns pertaining to environmental issues, the environmental effects of SDs, and their perspectives about SD consumption after hearing statistics about harmful environmental effects of SDs. All interviews were recorded and transcribed; coding by two independent coders is currently in progress.

**Findings:** Preliminary findings demonstrate most of the children are unaware of the harmful environmental impacts of SD consumption. However, after being presented with statistics such as the role of major SD companies in plastic pollution and the presence of microplastics in SDs, participants expressed concern about health and environmental consequences of SD intake. Participants also indicated that sharing information about environmental effects of SDs on social media would encourage them to reduce their SD intake and drink more water.

**Implications:** These findings support the utility of integrating environmental messaging into the DC-SIPS intervention to reduce SD intake and increase water intake among African American youth in Washington, D.C. Next steps will include a facilitated workshop with participants to co-create culturally relevant environmental messaging and prototype social media content, which will be further refined in additional in-depth interviews with youth in the focal population.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### The FRESH Study: A Longitudinal Analysis of Stress, Sleep, and Exercise among the GW Student Population

**Background:** Undergraduate years represent a pivotal period marked by transforming health behaviors. As students progress through college, they experience shifts in academic loads, social environments, and lifestyle habits that can considerably impact their well-being. The FRESH (Fitness, Rest, and Exercise for Strength and Health) Study was designed to evaluate these longitudinal changes among undergraduate students at the George Washington University. To better understand the trajectory of student health, we analyzed their levels of stress, sleep, and physical activity over these four years.

**Methods:** Four cohorts of first-year students were recruited in Fall 2021 (n=71), Fall 2022 (n=111), Fall 2023 (n=90), and Fall 2024 (n=134). Each year, participants completed health questionnaires, including assessments in stress (PSS-10), sleep (PSQI), and physical activity (IPAQ). Data were analyzed using descriptive statistics, paired t-tests, and mixed-effects models in R and Stata.

**Results:** Among all participants in their first year of college (n=405), a vast majority (74.8%) reported moderate or high stress levels, and almost half (47.7%) did not meet physical activity recommendations. Longitudinal findings from the Fall 2021 cohort (n=71) indicate a significant decrease in perceived stress scores ( $19.7 \pm 7.3$  vs  $17.9 \pm 6.2$ ;  $p=0.04$ ) and increase in sleep duration ( $6.96 \pm 1.16$  vs  $7.30 \pm 1.09$  hours;  $p=0.02$ ) between their first and fourth year. Self-reported moderate-or-vigorous physical activity non-significantly increased ( $163 \pm 19$  vs  $199 \pm 25$  minutes per week,  $p=0.15$ ), and the proportion of this cohort who met physical activity recommendations rose from 42.3% to 52.1% over the four years. However, mean body mass index (BMI) significantly increased in this time ( $23.6 \pm 3.5$  vs  $24.6 \pm 3.9$ ;  $p < 0.01$ ). The percentage of participants (n=71) with a BMI outside the healthy range (18.5 to 24.9) rose from 26.8% in their first year to 40.9% in their fourth year.

**Conclusion:** While these improvements in stress, sleep, and exercise suggest students may positively adapt to college life, they may not fully offset potential changes in diet or metabolic health—areas that warrant further research for this population. Findings from the FRESH Study highlight the importance of college health surveillance and early wellness interventions to prevent chronic disease before harmful habits become ingrained.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Feasibility and Acceptability of DC-SIPPY: Decreasing Young Children's Sugary Drink Intake through Pediatricians and Social Marketing

**Background:** Sugary drinks (SDs) are a major source of added sugar in children's diets, and diets high in SDs increase children's risk of developing overweight or obesity. Black children are more likely to have higher SD intake than their white counterparts. The purpose of this study is to investigate the feasibility and acceptability of DC-SIPPY, a multilevel intervention for parents of young Black children in Washington, DC, to lower children's SD intake and increase water intake.

**Methods:** Parents of Black children aged one to five who reported that their child consumed SDs on most days of the week were recruited from Children's National at THEARC, Children's National at Anacostia, and community organizations in Ward 8 of Washington, DC. Participants attended two Zoom interviews with a research assistant, one at enrollment and one at the completion of the six-week program. Participants met with a research assistant virtually for motivational interviewing and then followed a DC-SIPPY Instagram account that shared daily posts about reducing SD intake and increasing water intake for six weeks. Participants also completed weekly surveys about their child's beverage consumption throughout the six-week program. Qualitative interviews conducted during the post-intervention Zoom meeting were used to assess the feasibility and acceptability of the program. All interviews were transcribed verbatim and qualitative coding is currently in progress using a combined inductive and deductive approach.

**Results:** Preliminary findings demonstrate that DC-SIPPY is feasible and acceptable. Participants enjoyed water filters and sippy cups that were provided and found the Instagram posts informative and engaging. Some participants also noted that study participation enhanced bonding with their child. Based on parent-report, young children's mean SD consumption decreased (-10 ounces per day,  $p = 0.0001$ ) and water intake increased (+4 ounces per day,  $p=0.04$ ) from baseline to 6-weeks. In fact, nearly all parents reported decreases in their child's SD consumption (20 of 21) at the end of the six-week program and decreases were reported across all SD subcategories including 100% fruit juice, sweetened juice drinks, flavored milk, regular soda, sweetened tea, and sports drinks, while water intake increased (13 of 21) between baseline and follow up.

**Conclusion:** DC-SIPPY is feasible and acceptable to the target population and resulted in promising decreases in young children's SD intake and increases in water intake. Findings from this pilot study will be used to submit a grant application to more robustly test the efficacy of DC-SIPPY in a larger sample.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Healthy Eating Index (HEI) - 2020 differences across fit young, healthy women with distinct body mass indexes (BMI)

**Purpose:** The Healthy Eating Index (HEI)-2020 is a tool used to assess overall diet quality and evaluate the intake of specific dietary components. This study aims to use the HEI to examine differences in diet quality among women who exercise 6 or more hours per week categorized by body mass index (BMI) as lean (18.5 to 24.99 kg/m<sup>2</sup>) and obesity ( $\geq 30$  kg/m<sup>2</sup>). By analyzing dietary patterns across these groups, this research seeks to determine whether BMI status is linked to diet quality, even among healthy individuals. The findings from this study will offer valuable insights for developing targeted nutritional guidelines, highlighting the importance of balanced eating habits regardless of body composition.

**Methods:** This ongoing study includes n=40 young women (ages 21-40). For this abstract, we analyzed data from n=6 lean-exercisers and n=3 obesity exercisers. Each participant completed a total of three visits. Visit A body composition was assessed using DXA to determine fat mass (lb), fat-free mass (lb), bone mineralization, and estimated visceral adipose tissue (VAT). Following this assessment, participants completed three physical performance tests to evaluate strength and fitness levels: grip strength test, isometric mid-thigh pull (IMPT), and VO<sub>2</sub> max test. During Visit B and C, blood samples were collected from each participant in the lab, processed, and analyzed. Participants used the Cronometer app to track their food intake through the duration of the study, 7 to 12 days. Data from the Cronometer app was downloaded and uploaded to the NDSR software to calculate each participant's HEI score. HEI scores were categorized as follows: excellent (80-100), good (51-79), and poor (0-50). The final HEI scores between BMI groups will be analyzed using a t-test to assess differences in dietary quality.

**Results:** The study's data collection is still ongoing; preliminary observations suggest potential differences in HEI-2020 scores between the two BMI groups: lean-trained and obesity-exercisers. Based on some trends we have observed and the data from the Cronometer app, we hypothesize that lean exercisers will have higher HEI scores, likely falling between excellent or good categories. In contrast, obesity-exercisers may demonstrate lower HEI scores, failing between good or poor categories, suggesting poorer dietary patterns despite their active lifestyle.

**Conclusion:** Our findings are expected to reveal differences in diet quality and body composition, between the two BMI groups. These results will emphasize the critical role of dietary patterns in supporting metabolic health, even among individuals who maintain an active lifestyle.

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# GWSPH RESEARCH SHOWCASE

# EXERCISE AND

# NUTRITION SCIENCES

## Rooting for Equity in Washington, D.C.

**Background:** Through the Sustainable DC 2.0 Plan, the District of Columbia (DC) is working towards the goals of using 20 more acres of its land for urban agriculture by 2032 and building 12,000 affordable housing units by 2025. This applied public health research project seeks to identify the political, social, economic, and structural barriers and facilitators to expanding urban agriculture projects within affordable housing communities in DC, and develop policy and practice recommendations to foster inclusive and equitable expansion of UA initiatives within affordable housing communities. UA is often used to address food deserts and a lack of services within a community, yet inequities persist due to restrictive policies, racial and class disparities, and limited city support. Recognizing these challenges is crucial for advancing food justice and inclusive UA within affordable housing communities.

**Methods:** We identified affordable housing developers, residents of affordable housing communities, urban farmers, and government officials within DC as key stakeholders in this study. We conducted in-depth interviews from June - August 2024 with all participants using a semi-structured in-depth interview guide. Interviews were transcribed verbatim and checked for accuracy. We developed a codebook comprised of 54 codes using inductive and deductive methodologies. Two trained research assistants coded all transcripts. We completed an emergent thematic analysis, synthesizing our data into domains and themes. We triangulated, verified, and finalized findings and recommendations through a convening of stakeholders in February 2025.

**Results:** We spoke to n=47 stakeholders (n=15 residents, n=15 government officials, n=6 housing developers, and n=11 urban farmers). We identified 9 themes across 3 domains. We found that the meaning and purpose of urban agriculture take various forms, but the benefits are widely understood. Cross-sector collaborations throughout planning and development, urban agriculture champions, and community leadership and engagement were found to foster successful urban agriculture work. The expansion of urban agriculture is often hindered by competing priorities, limited resources, and limited knowledge.

**Conclusions:** These findings will be used to inform policies and practices for expanding urban agriculture in DC and similar municipalities. Our recommendations are as follows:

1. Provide proof-of-concept models of urban agriculture within affordable housing communities that detail successful projects within the setting.
2. Avoid top-down decision-making; instead, prioritize urban agriculture projects to reflect the unique needs and capabilities of each community.
3. Continue to strengthen urban agriculture through economic, infrastructure, and educational investments.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Exercise Metabolic Flexibility is Not Associated with Body Fat in Healthy Young Adults

**Background:** Metabolic flexibility (MetFlex) describes the ability to adjust substrate oxidation in response to evolving energy demand. Blunted MetFlex is associated with worse cardiometabolic health outcomes and obesity using BMI as a measure of adiposity.

**Purpose:** To determine the effect of body fat measures on exercise metabolic flexibility in young adults.

**Methods:** Young adults (ages 18-40;  $n = 36$ , 19 females) were scanned via dual X-ray absorptiometry (DXA) before completing a graded exercise test (GXT) on a cycle ergometer to determine maximal aerobic capacity ( $VO_{2PEAK}$ ). Participants returned to the lab for two, 10-min bouts at 55%  $VO_{2PEAK}$  separated by 10 minutes seated rest ( $n = 28$ ) or  $\geq 48$  hours ( $n = 8$ ). Exercise MetFlex was defined as the difference between fasting fat oxidation (FOX) and either peak fat oxidation (PFO) for the GXT or the averaged steady-state FOX during the fixed exercise bouts. Multivariate linear regression was used to determine the effects of body fat percentage (BF%), fat mass, and estimated visceral adipose tissue (VAT) volume on each exercise MetFlex measure while adjusting for sex, absolute  $VO_{2PEAK}$ , and measured % $VO_{2PEAK}$  during the fixed exercise bouts. Student's t-tests were used to compare measures between sexes. An  $\alpha = 0.05$  was determined a priori.

**Findings:** Compared to males, females had lower  $VO_{2PEAK}$  ( $3.1 \pm 0.6$  vs.  $2.3 \pm 0.4$  L/min;  $p < 0.001$ ), higher BF% ( $24.1 \pm 7.7$  vs.  $33.8 \pm 6.2$ ;  $p < 0.001$ ), and lower VAT ( $34.3 \pm 6.4$  vs.  $12.5 \pm 5.9$  in<sup>3</sup>;  $p = 0.008$ ). Exercise MetFlex to the GXT was not associated with BF% ( $p = 0.256$ ), fat mass ( $p = 0.285$ ), nor VAT ( $p = 0.605$ ). Similarly, exercise MetFlex to the fixed bouts was not associated with BF% ( $p = 0.901$ ), fat mass ( $p = 0.938$ ), nor VAT ( $p = 0.444$ ). For all three body fat measures, males had lower exercise MetFlex to the GXT ( $p \leq 0.016$ ) and to fixed exercise ( $p \leq 0.015$ ) in multivariate regression analyses. Higher  $VO_{2PEAK}$  was associated with better exercise MetFlex to the GXT ( $r = 0.49$ ,  $p = 0.002$ ) and during fixed exercise ( $r = 0.51$ ,  $p = 0.002$ ), likely due to females' relatively higher fitness when adjusting for absolute  $VO_{2PEAK}$ . Adjusting for  $VO_{2PEAK}$  normalized to fat-free mass (mL/kg FFM/min) showed no effect of sex on either exercise MetFlex measure (all  $p \geq 0.376$  for GXT; all  $p \geq 0.605$  for fixed).

**Conclusion:** Body fat is not associated with exercise metabolic flexibility in healthy young adults.

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# GWSPH RESEARCH SHOWCASE

# EXERCISE AND

# NUTRITION SCIENCES

## Machine Learning Improves Prediction of Visceral Adipose Tissue Area Using Only Clinical and Anthropometric Variables

**Background:** Visceral adipose tissue (VAT) area is independently associated with increased cardiometabolic disease risk, but its measurement requires radiation exposure and expensive equipment.

**Purpose:** To assess if machine learning models could improve on published visceral adipose tissue (VAT) area prediction equations using common anthropometric, demographic, clinical, and physiological variables.

**Methods:** Data from the Studies of a Targeted Risk Reduction Intervention through Defined Exercise (STRRIDE) (n=1264 adults; age  $53.8 \pm 8.9$ ; BMI  $30.0 \pm 3.1$  kg/m<sup>2</sup>) were used to predict log-transformed VAT (lnVAT) measured via CT scan at the L4 pedicle. Model 1 averaged results from two published linear regression equations with BMI, waist circumference, age, sex, and race (n=1143). Four random forest models were created and evaluated based on their ability to predict lnVAT in comparison to Model 1. The random forest models included: Model 2) prediction with body weight, BMI, waist and hip circumferences, waist-to-hip ratio, age, race/ethnicity, and sex (n=1139); Model 3) inputs from Model 2 plus skinfolds from four sites (n=755); Model 4) inputs from Model 2 plus fasting glucose, insulin, blood lipids, and GlycA (n=1019); Model 5) inputs from all previous models (n=650); and Model 6) inputs from all previous models plus cardiorespiratory fitness and fasting amino acid and lipoprotein concentrations (n=610). Models were selected using 10-fold cross-validation, evaluated using cross-validated R<sup>2</sup>, and visualized using Bland-Altman plots.

**Results:** The published prediction equations were inaccurate (Model 1 R<sup>2</sup> = 0.409) with wide limits of agreement (LoA) (-118 to 157 cm<sup>2</sup>). Prediction was improved with a random forest Model 2 (R<sup>2</sup> = 0.649) with narrower LoA (-42.3 to 35.0 cm<sup>2</sup>). Addition of skinfolds (Model 3 R<sup>2</sup> = 0.685; LoA = -38.1 to 31.2 cm<sup>2</sup>), fasting clinical measures (Model 4 R<sup>2</sup> = 0.653; LoA = -40.4 to 32.5 cm<sup>2</sup>), skinfolds and clinical data (Model 5 R<sup>2</sup> = 0.698; LoA = -35.7 to 28.9 cm<sup>2</sup>), or advanced physiological measures (Model 6 R<sup>2</sup> = 0.694; LoA = -36.3 to 29.2 cm<sup>2</sup>) did not significantly improve model R<sup>2</sup> (p = 0.181) in comparison to Model 2.

**Conclusion:** Existing prediction anthropometric equations were unable to accurately predict VAT area in this sample. Use of machine learning methods with the addition of common anthropometric and demographic variables significantly improves prediction. The addition of skinfolds, clinical variables, or advanced physiological variables did not improve VAT area predictions. Further testing is needed to see if predicted VAT is still associated with increased cardiometabolic disease.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Feeding Decreases Postprandial Arterial Stiffness in Young Adults

**Background:** Overfeeding acts as a primary factor in the obesity epidemic in the United States. This is concerning as obesity serves as a leading contributor to the onset of cardiovascular disease (CVD). Arterial stiffness, as measured by pulse wave analysis (PWA) and pulse wave velocity (PWV), can serve as an early detection method for CVD, as it is commonly elevated in individuals with CVD, prediabetes, and type 2 diabetes. Several studies have investigated the arterial response during the postprandial period, utilizing various feeding challenge methods. To our knowledge, there is no research on the effect of caloric content (eucaloric vs hypercaloric) on postprandial measures using a mixed meal challenge intervention. In this study, we hypothesize that the consumption of hypercaloric meals will lead to a significant reduction in these indices compared to eucaloric meals in healthy adults, as measured by PWA and PWV.

**Methods:** Young adults (n=12) were recruited to participate in a randomized crossover trial. Body composition was measured via dual X-ray absorptiometry (DXA) before measuring maximal aerobic capacity (VO<sub>2</sub>peak) on a cycle ergometer. On two subsequent visits, participants consumed a eucaloric or hypercaloric liquid mixed meal challenge after an overnight fast. Resting metabolic rate was used to determine caloric content. Arterial stiffness via PWA and PWV was measured at baseline (0 min) and postprandial (60, 120 min) timepoints. Mixed-effects models were used to assess the effect of meal type (hypercaloric vs. eucaloric) and time on arterial stiffness from PWA and PWV while accounting for repeated measures.

**Results:** Participants were otherwise healthy young adults (age:  $21.9 \pm 3.2$  yrs, BMI:  $24.1 \pm 3.8$  kg/m<sup>2</sup>). There was no effect of calorie content on postprandial arterial stiffness (PWA:  $p = 0.525$ ; PWV:  $p = 0.176$ ). Arterial stiffness via PWA decreased from baseline to 60 minutes ( $p = 0.001$ ) but returned to baseline by 120 minutes ( $p = 0.124$ ). Arterial stiffness via PWV was not different from baseline at 60 minutes ( $p = 0.182$ ) or 120 minutes ( $p = 0.584$ ).

**Conclusion:** Meal size may not affect indices of arterial stiffness following a liquid mixed meal challenge in healthy adults. Further data collection may provide a better understanding of the effects of eucaloric and hypercaloric meals on these measures.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### U.S. parents' perceptions of the safety and healthfulness of non-sugar sweeteners for children

**Background and significance of the study:** Non-sugar sweeteners (NSS) are increasingly present in packaged foods and beverages, including in products marketed to children. However, the long-term effects of NSS on health are still debated.

**Purpose of the study:** To assess U.S. parents' perceptions of the safety and healthfulness of NSS for children, confidence in identifying NSS on product packaging, views on NSS front-of-package labels, and opinions about terminology used to refer to NSS.

**Methods:** A total of 1,047 parents of children aged 2–12 years from across the U.S. completed a 32-item survey. The survey included 15 items about general perceptions of NSS, focusing on their healthfulness and safety; 10 items on perceptions of the safety and healthfulness of NSS specifically for children; and 6 items on NSS identification and labeling. Participants responded using 5-point Likert scales ranging from “strongly disagree” to “strongly agree.” Additionally, participants were asked to select the most understandable and preferred terms for NSS from a list of terms provided. Descriptive statistics, including means and frequencies, were used and exploratory factor analysis will be conducted to analyze the responses.

**Findings and conclusion:** Most participants were 30–49 years old (84.9%), 86.9% identified as White, and 11.7% were Hispanic or Latino. Over half (58.1%) of parents believed NSS could help reduce children's sugar intake, yet only 21.9% felt confident that NSS were safe for children to consume daily. Artificial NSS (e.g. aspartame, sucralose) were viewed as less safe for children (26.6% deemed them safe) compared to “natural” NSS such as stevia or monk fruit extract (60.5% deemed them safe). Parents indicated support for a NSS front-of-package label, with 92.6% agreeing it would help them identify NSS in products and 44.1% reporting it would decrease their likelihood of providing NSS-containing products to their children. The term artificial sweeteners was the most recognized, with 41.7% of the parents indicating that it was the most understandable compared with other terms including non-sugar sweeteners (24.3%), sugar substitutes (21.8%), or low-calorie sweeteners (5.5%). While U.S. parents perceive NSS as useful for reducing sugar intake, they reported concerns about the safety and healthfulness of NSS for children, particularly artificial sweeteners.

**Implications:** The findings highlight the potential of front-of-package labels for NSS to help parents make informed choices about giving their children products with NSS, aligning with the precautionary principle of public health that emphasizes minimizing potential risks, particularly for vulnerable populations like children.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Analyzing Fiber Intake and Gut Health in Lean Premenopausal Women with Different Fitness Levels: Lean-Exercisers vs. Lean-Non-Exercisers

**Purpose:** This study investigates the relationship between dietary fiber intake and gut health markers (stool pH and Bristol Stool Scale BSS) with fitness in lean exercisers versus lean non-exercisers in women. This will help determine if exercise influences the gut's response to dietary fiber and its association with metabolic health and fitness outcomes.

**Methods:** This ongoing study includes n=40 young women (ages 21-40). For the present abstract, we analyzed n=10, lean non-exercisers (n=4, exercising 0–2 hours per week; Ln-NEX) and lean exercisers (n=6, exercising  $\geq 6$  hours per week; Ln-EX). A lean woman has a low body fat percentage relative to her total body mass. A total of three visits were required for each participant. During the baseline visit (VISITA), participants completed a battery of lifestyle questionnaires. During both Visit B and Visit C, biological stool samples were collected from participants, processed, and frozen. Stool samples were collected at home and returned to the laboratory frozen during Visit B to capture baseline gut health (pH and Bristol Stool Scale, BSS). Participants used the Cronometer app to track their food intake throughout the study, 7 to 12 days.

**Preliminary Findings and Conclusions:** Data showed a higher caloric fiber intake in Ln-EX ( $29.22 \text{ g} \pm 13.09 \text{ g}$ ) than in Ln-NEX ( $12.23 \text{ g} \pm 9.26 \text{ g}$ ) women. Ln-EX had no significant differences in the stool pH (pH  $6.17 \pm 0.90$ ) or BSS (BSS  $4.25 \pm 0.96$ ) compared to Ln-NEX (pH  $6.22 \pm 0.44$ , BSS  $4 \pm 0$ ). However, Ln-EX had significantly higher weekly bowel movements,  $9.5 \pm 4.91$ , compared to Ln-NEX,  $4.5 \pm 0.87$ .

**Implications:** This data suggests that while exercise may not significantly alter stool pH or BSS outcomes, Ln-EX tend to have higher fiber intake and more frequent bowel movements, indicating potential benefits in gut health associated with exercise and fiber consumption. Further research is needed to explore the underlying mechanisms linking these factors.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Game, Set, Match: What Makes Tennis Fun for Players with Autism Spectrum Disorder and Other Neurodevelopmental Disorders

**Background:** Individuals with autism spectrum disorder (ASD), a neurodevelopmental disorder (NDD) affecting as many as 78 million people worldwide, often do not get sufficient physical activity, which exacerbates common comorbid conditions like obesity, low bone density, and hyperlipidemia. Adaptive physical activity programs provide substantial motor (e.g., visuomotor coordination, balance, fine motor skills) and behavioral (e.g., improved attention, executive function, social motivation, reduced repetitive behaviors) benefits. These gains depend on continued participation, which is best sustained when physical activities are fun. Understanding what makes these activities fun is critical for motivating sustained engagement, an area that, despite growing interest, remains understudied in neurodivergent populations. To address this, tennis players (n=139) with ASD and co-occurring NDDs participating in an adaptive tennis program, along with parents/caregivers (n=94), and program staff (n=134), were engaged in mixed-method group concept mapping to identify key determinants of fun. Perceived importance of these determinants by players, parents/caregivers, and program staff was also investigated.

**Methods:** Group concept mapping involved participation in structured brainstorming that identified 37-determinants of fun and included the completion of sorting and rating tasks. These data, when integrated with multivariate analyses, produced a concept map that organized the determinants into clustered themes. Pattern match and go-zone displays were generated to conduct within- and between-group comparisons, followed by tests of significant group difference.

**Results:** The best-fitting concept map yielded a solution that organized the 37 fun determinants into 7-thematic clusters: *Self Improvement & Growth*, *Positive Coaching Interactions*, *Social Connections*, *Skill-Based Development*, *Program Design*, *Equity & Inclusion*, and *Social-Emotional Development*. Among players, the importance of the clusters, and determinants, was remarkably similar regardless of sex, age, years involved, and skill level. Few statistically significant differences were observed in comparisons of players and parent/caregivers perceived importance, though considerable differences were observed between players and program staff with large effect sizes of difference.

**Conclusion:** What makes tennis fun for neurodivergent players spans the tennis ecosystem. Results were comparable to studies of neurotypical players, while also identifying determinants unique to making tennis fun for a neurodivergent population. Findings suggest parents/caregivers, who often play a larger role in activities for their children, are valuable sources of information for understanding their child's sport needs. Findings also identified how sport administrators and coaches can improve and prioritize neurodiverse players' needs to design and deliver evidence-informed programming that makes tennis, and adaptive sport broadly, the most fun and beneficial experience possible for its participants.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Association between healthy food diversity and frailty progression in older adults: Findings from the Baltimore Longitudinal Study of Aging

**Background:** Given the population aging trends, prevalence of frailty is increasing, posing challenges to health and social care systems worldwide. The progression of frailty may be slowed down through timely interventions and management, such as consuming a nutrient-dense diet that includes various healthful foods.

**Objective:** To examine the association between diet diversity, measured using the U.S.-based Healthy Food Diversity (HFD) index, and frailty progression over time in older adults.

**Methods:** We analyzed data from participants aged 60 years and older from the Baltimore Longitudinal Study of Aging. A total of 1137 participants (51.7% female) with an average age of 71 years were included in this analysis. Dietary intake over the past year was assessed using a validated semi-quantitative food frequency questionnaire. The U.S.-HFD index was computed based on the consumption of 17 food groups from the Healthy U.S.-Style Dietary Pattern, Dietary Guidelines for Americans 2020 recommendations. The mean HFD index across each participant's visits was standardized using Z-score transformation. Frailty status was operationalized using the 43-item Frailty Index (FI), which evaluated deficits across various health domains such as activities of daily living (ADL), cognitive status and grip strength. The FI ranges from 0 to 1, with a value closer to 1 suggesting a higher risk of being frail. A linear mixed-effect model, adjusted for total energy intake and sociodemographic characteristics, was used to examine the longitudinal associations between HFD and FI.

**Results:** The average HFD index among our participants was 0.33 (SD: 0.11), which is comparable with the reported value from the previous studies. Results from the multivariable-adjusted linear mixed effects model suggested that, over an average follow-up period of 4.2 years, each one-unit increase in the Z-score of HFD was significantly associated with a decrease in the FI over time ( $\beta = -0.004$ , 95% CI=  $-0.007$  to  $-0.0006$ , p-value=0.019). No significant interaction between HFD and sex was observed.

**Conclusion:** Over time, a higher HFD was significantly associated with a slower progression of frailty.

**Implication:** Our findings suggest that maintaining a diverse, healthy diet may significantly slow the progression of frailty among older adults. Fostering a food environment that promotes food diversity could be an important, modifiable strategy to support healthy aging and independence in later life.

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# GWSPH RESEARCH SHOWCASE

# EXERCISE AND

# NUTRITION SCIENCES

## An Assessment of Recipe Recommending Mobile Applications

**Background:** Mobile applications have become popular tools for health management, addressing needs ranging from chronic disease management to controlling infectious diseases. Mobile health interventions, delivered via apps or text messages, have also proven useful for health education. Among these mobile applications, those offering recipe recommendations have demonstrated effectiveness in helping users manage their diets. The rising popularity of recipe recommendation apps has prompted the need for an assessment of the functions provided by these applications.

**Methods:** A review of popular mobile applications providing completely free services was conducted. The criteria for selecting these applications were based on listings from either the App Store or Google Play Store. Applications were identified by searching the keyword "Recipes" and had to have a rating higher than 4.0 out of 5. Specifically for the App Store, mobile applications were required to belong to categories such as "health and fitness," "lifestyle," or "food and drinks. Additionally, the applications needed to have more than 10,000 user reviews and offer an English-language version. The selected mobile applications (n=6) were evaluated for their personalized recommendation function.

**Results:** Three of the selected mobile applications did not provide any form of personalized recommendation. One mobile application allowed users to select preferences for cultural cuisines; however, these selections did not appear to influence the recommendations provided. Another application asked users to choose between vegetarian and non-vegetarian options and recommended only vegetarian recipes to those selecting vegetarian preferences. The remaining application asked users to select between vegetarian and non-vegetarian diets and indicate cultural cuisine preference, with recommendations reflecting both selections. Four applications included nutritional content information for the dishes prepared using their recipes. Additionally, four applications provided recipes developed by professional chefs employed by their companies, while two applications featured user-submitted recipes.

**Conclusion:** Among the six evaluated applications, most lacked personalized recommendation features. The majority provided recipes developed by professional chefs and included nutritional information for dishes prepared from these recipes. Future research should incorporate a detailed analysis to evaluate the nutritional quality and overall healthiness of the provided recipes.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Plasma branched-chain amino acid levels and cardiovascular disease risk factors: a longitudinal analysis of a lifestyle trial

**Purpose:** Branched-chain amino acid (BCAAs) levels have been associated with a higher risk of cardiovascular diseases (CVD), but studies of CVD risk factors have mainly been cross-sectional. We examined the longitudinal association between changes in BCAA levels and CVD risk factors in a lifestyle trial.

**Method:** We used data on 708 male and female participants, aged 25-78, of the U.S. PREMIER study. Data and biospecimens were from the NHLBI Biologic Specimen and Data Repository Information Coordinating Center. Participants were divided into control, lifestyle intervention, or lifestyle plus DASH diet groups. Biomarkers were measured with NMR spectroscopy. Multiple linear regression models assessed changes in BCAA levels in relation to changes in cardiometabolic risk factors over 6 months. Estimates were expressed per SD change in BCAA levels and adjusted for age, sex, race, marital status, region, and body mass index changes.

**Results:** Increases in BCAA levels were associated with increases in insulin resistance (HOMA-IR) (Beta = 0.22, SE = 0.07,  $p = 0.005$ ), inflammation (GlycA) (Beta = 0.03 mmol/l, SE = 0.004,  $p < 0.001$ ), Apolipoprotein B (Beta = 0.02 g/l, SE = 0.006,  $p < 0.001$ ), and VLDL-cholesterol levels (Beta = 0.03 mmol/l, SE = 0.007,  $p < 0.001$ ). Associations for other lipoprotein measures differed for individual BCAAs. Increases in valine were associated with LDL-cholesterol (Beta = 0.07 mmol/l, SE = 0.01,  $p < 0.001$ ), with no significant association for leucine and isoleucine. Isoleucine was inversely associated with HDL-C (Beta = -0.03 mmol/l, SE = 0.01,  $p < 0.001$ ) and Apolipoprotein A (Beta = -0.02 g/l, SE = 0.009,  $p = 0.004$ ). Also, leucine was inversely associated with HDL-C (Beta = -0.04, SE = 0.01,  $p < 0.001$ ), Apolipoprotein A (Beta = -0.03, SE = 0.009,  $p < 0.001$ ) and triglyceride (Beta = -0.05 (mmol/l), SE = 0.01,  $p = 0.004$ ) while valine had a direct association with HDL-C (Beta = 0.03, SE = 0.01,  $p < 0.001$ ), Apolipoprotein A (Beta = 0.04, SE 0.009,  $p < 0.001$ ) and triglyceride (Beta = 0.06, SE = 0.01,  $p = 0.001$ ). BCAA levels were not significantly associated with fasting glucose and blood pressure.

**Conclusion:** Increases in BCAA levels were associated with insulin resistance, inflammation, and unfavorable lipid profiles. These findings support BCAA levels as a target for CVD prevention. Further research is warranted to elucidate possible differences in the effects of individual BCAAs on lipid metabolism.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Multi-Month, Ultra-Endurance, Backpacking Impacts Fuel Selection and Aerobic Capacity: A Case Study

**Background:** Multi-month, ultra-endurance backpacking treks are popular among experienced hikers, yet there is limited research describing the effects on cardiovascular fitness and fuel substrate utilization in the population undertaking large volumes of consistent, low-to-moderate intensity aerobic activity.

**Purpose:** This study aimed to observe the effects of a multi-month backpacking event in the wilderness on aerobic capacity.

**Methods:** An experienced backpacker (30.1yrs; 78.3kg; 179.1cm) completed a wilderness-based backpacking trek known as the Appalachian National Scenic Trail northbound thru-hike. The participant hiked 3,531km and accumulated 99,643m elevation gain over 139 days. Maximal aerobic capacity data was collected at 4 time points (PRE-, MID-, POST-, and 4-WK-POST). Indirect calorimetry via metabolic cart was used to assess maximal aerobic capacity under standardized conditions. Data are reported as percent changes from pre-trek baseline (PRE).

**Results:** The participant lost 2.68kg over the 139-d trek with an increase in aerobic capacity. Specifically, absolute VO<sub>2</sub> max (absVO<sub>2</sub>max, PRE 3.960L/min, MID 4.037L/min, POST 4.274L/min, Δ7.93%) and relative VO<sub>2</sub> max (relVO<sub>2</sub>max, PRE 50.60ml/kg/min, MID 51.50ml/kg/min, POST 55.90ml/kg/min, Δ10.47%) increased in response to trek demands. 4-WK-POST trek, absVO<sub>2</sub>max (2.5%) and relVO<sub>2</sub>max (3.36%) returned to near-baseline levels (ΔPRE). Trek demands elicited earlier reliance on carbohydrates as the predominant fuel source during maximal aerobic activity testing immediately after the event, evidenced through the time at crossover point (TCP, PRE 3:34min, MID 2:50min, POST 2:32min, Δ-28.97%) and percentage of VO<sub>2</sub> max at crossover point (pctVO<sub>2</sub>max\_CP, PRE 80.60%, MID 61.36%, POST 49.91%, Δ-30.69%) before trending towards baseline levels 4-WK-POST (TCP, 13.55%) (pctVO<sub>2</sub>max\_CP, 16.36%).

**Conclusion:** Completing a 139-d independent ultra-endurance trek in the wilderness increases aerobic capacity in response to greater cardiovascular demand, stress, and activity exposure. During maximal aerobic capacity testing, predominant carbohydrate utilization occurs at lower intensities, despite increased aerobic capacity. Upon cessation of marked daily physical activity post-trek, the cardiovascular system swiftly reverts to pre-trek aerobic baseline. Returning to a regular diet post-trek increased the time and intensity of primary fuel source crossover during maximal aerobic exercise, though values failed to reach pre-trek baseline.

**Practical Application:** To mitigate a rapid decline in aerobic capacity following an ultra-endurance challenge, it may be useful to integrate a post-trek recovery plan that facilitates regular aerobic activity. Further, metabolic adaptations demonstrated throughout the trek may guide extended dietary planning for self-supported ultra-endurance events.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Physical Activity, Mentorship, and Mental Health in Adolescents Living in Washington, DC: Teens Run DC

**Background:** Mental health is a serious concern among US adolescents. We examined the role of a combined running/mentorship program, Teens Run DC (TRDC), on self-reported indicators of mental health in high-school students (N=294) living in Washington, DC.

**Methods:** The TRDC program was offered in twelve high-schools across seven DC wards between 2010 and 2018. We used a quasi-experimental design within each school to determine the relation between the received dose of the TRDC program and indicators of depression and social connectedness in students who did and did not participate in the program. Data were collected at the beginning and end of each school year, using the Center for Epidemiological Studies Depression in Children scale (CES-DC) and the Hemingway Social Connectedness (HSC) scale. Mixed-effect regression modeling examined the dose-response relationship between participation dose and mental health scores.

**Results:** High school students who completed at least two years of TRDC lowered their CES-DC score by 6 points ( $\beta=-6.1$ , 95%CI: -11.1, -1.3) and had a 69% lower odds of clinical depression (OR=0.31; 95%CI: 0.23, 0.41), compared with students receiving less than one year. Similarly, students with two or more years of TRDC increased their overall HSC score by 8 points ( $\beta=8.3$ ; 95% CI: 1.0, 15.5), relative to those with less than one year of exposure. The benefits of TRDC were especially pronounced in female students and those identifying as Hispanic.

**Conclusion:** These findings indicate that a running/mentoring program has substantial mental health benefits for high school students and this is particularly so for teenage girls.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND

## NUTRITION SCIENCES

### GSLEEP: Gut Health and Sleep Quality Across Young Lean Women with Distinct Fitness Levels

**Purpose:** Sleep is essential for the healthy functioning of every individual, with widespread positive effects throughout the body; however, the mechanisms are largely unexplored. While prior research highlights positive links between exercise, sleep quality, and gut health, the role of the gut-brain axis in sleep regulation calls for further study. Therefore, this study investigates the potential relationship between these factors, focusing on the impact of exercise on gut health, and its effects on overall sleep quality.

**Methods:** This ongoing study includes  $n=40$  young women (ages 21-40). For the present abstract, we analyzed  $n=7$  lean exercisers (exercising  $\geq 6$  hours per week) and  $n=3$  lean non-exercisers (exercising  $\leq 2$  hours per week). A total of three visits were required for each participant. During the baseline visit (Visit A), participants completed a sleep quality questionnaire, which was later evaluated using the Pittsburgh Sleep Quality Index (PSQI). During Visit B, participants were instructed to complete a 30-minute exercise session on a cycle ergometer at 60-70% of their Heart Rate Reserve. Stool samples were collected at home and returned to the laboratory frozen. Visit C took place 24 hours post-exercise, during which follow-up stool samples were obtained. All samples were later analyzed using the Bristol Stool Scale (BSS) and pH measurements.

**Preliminary Findings and Conclusions:** Lean exercisers (Self-reported exercise 280 minutes  $\pm$  28 min;  $VO_{2peak}$  48.55 L/kg  $\pm$  10.14 L/kg; hand-grip test 34.56 kg  $\pm$  10.18 kg) had no significant differences in the pH (pH 6.17  $\pm$  0.90) in stool samples or BSS (BSS 4.25  $\pm$  0.96) (Bowel movement per week 9.5  $\pm$  4.91) compared to lean-nonexercisers (self-reported exercise 0 minutes  $\pm$  0 min;  $VO_{2peak}$  26.58 L/kg  $\pm$  3.53 L/kg; hand-grip test 13.33 kg  $\pm$  4.04 kg) (pH 6.22  $\pm$  0.44) (BSS 4  $\pm$  0) (Bowel movement per week 4.5  $\pm$  0.87).

**Implications:** This study examines the correlation between gut health and sleep quality in lean exercising and non-exercising women using stool pH, BSS, and PSQI scores. Findings could enhance understanding of the gut-brain axis, benefiting those with poor sleep. Limitations include a small sample size and lab constraints, highlighting the need for further research.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

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### Female cohabitating partners' influence on adult men's Engagement on healthy food and physical activity behaviors to maintain a healthy weight: A Scoping Review

**Background:** Support from a romantic partner can be an important facilitator to engage in healthy behaviors among adult men. This study aimed to review the literature to identify the influence of live-in female partners on adult men's engagement in food and physical activity (PA) behaviors to maintain a healthy weight.

**Methods:** Articles were extracted from CINAHL, Scopus, PubMed, and PsychInfo through a review of the literature from December 2023- December 2024. Covidence software was used for screening and data extraction. PRISMA was used for data reporting. A priori, we tested keywords related to live-in female partner influence on adult men's food choices and PA found in the Medical Subject Headings Library (<http://www.nlm.nih.gov/mesh/>) by conducting mock searches to ensure that the final list of terms was captured in articles that met inclusion criteria. Inclusion criteria: peer-reviewed papers, studies that reported findings on adult men (>20 years) with live-in female partners and written in English. No limitations were placed on publication dates, study design, or geographical location where the study was conducted. Review papers, editorials, commentaries, or meeting abstracts were excluded. GW IRB determined the study did not require review for human subject research.

**Results:** 10,928 articles' titles and abstracts were screened; 103 articles were read for full-text review; 33 studies were included for data extraction. This study presents findings for African American (n=9) and Hispanic (n=4) men only.

Among African American males, female partners who cooked healthy meals (i.e., low in fat, and sodium), brought healthy foods to the home, shared meal times with husbands, and exercised together influenced men's engagement in healthy eating, PA, and weight management behaviors. Cooking meals high in fat, salt, and sugar and low in whole grains and not being sympathetic of men's participation in PA were female partners' unsupportive behaviors.

Among Hispanic male participants, female partners who knew a healthy diet and eating in moderation, cooked home meals, and supported their partner's management of their chronic conditions influenced men's engagement in healthy eating, PA, and weight management behaviors. Having a spouse living in the US was associated with men's weight gain, possibly due to greater access and availability of food in the household and high-caloric homemade meals.

**Conclusion:** Supportive behaviors that female partners use to encourage men's engagement in healthy behaviors could be used as effective strategies to foster a supportive environment for positive lifestyle changes and improved health outcomes among minority men.

# GWSPH RESEARCH SHOWCASE

## EXERCISE AND

## NUTRITION SCIENCES

### Effects of 'climate friendly' claims on food product perceptions and purchase intentions among U.S. adults

**Background and Significance** – Shifting to healthy and sustainable diets globally is essential for human and planetary health. Misleading environmental claims on unsustainable (i.e., high climate impact) food and beverage products may confuse consumers about their impact and influence purchasing intentions, undermining sustainability and nutrition goals. While it is known that nutrition claims lead to a 'health halo' effect, it is unclear whether environmental claims on unsustainable products have a 'sustainability halo' effect.

**Purpose** – The objective of this study was to evaluate the impact of environmental claims on U.S. consumers' perceptions of product sustainability, healthfulness, and intentions to purchase these products.

**Methods** – In an online survey, U.S. participants (n=2882) were randomized to view 4 food and beverage products carrying either a 'climate friendly' claim (treatment, n=1445) or no claim (control, n=1437). Animal-based foods (i.e., red meat and dairy) are associated with high greenhouse gas emissions, thus, we selected products in these categories to reflect unsustainable (high climate impact) products. After viewing each product, participants responded to questions including 'How good or bad for the environment/health do you think this product is?' and 'How likely would you be to purchase this product if you saw it at the store next week?' which were assessed on a 5-point Likert scale from 'Very Bad' to 'Very Good' and 'Very Unlikely' to 'Very Likely', respectively. Logistic regression was used to examine the effect of the 'climate friendly' claim on perceptions of product sustainability, healthfulness, and intentions to purchase.

**Findings & Conclusions** – Across all products, 48% (95%CI: 45.6-50.8%) of participants randomized to view the 'climate friendly' claim perceived the products to be environmentally sustainable, compared to 29% (CI: 26.6-31.4%) in the control group. 38% (CI: 35.6-40.6%) of participants who viewed the 'climate friendly' claim perceived the products to be healthy, compared to 31% (CI: 29.0-33.9%) in the control group. Compared to the control, participants who viewed the 'climate friendly' claim were more than 2 times as likely to perceive the products as sustainable ( $p<.001$ ), and more likely to perceive the products as healthy ( $p<.001$ ). Intentions to purchase the products did not differ between the treatment and control groups.

**Implications** – 'Climate friendly' claims were associated with higher perceived sustainability and healthfulness of unsustainable food and beverage products, indicating a sustainability and health 'halo' effect. These findings support the need for environmental claim regulation on food and beverage products to prevent greenwashing and ensure consumers have reliable information.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Metabolic Health in Young Adults: Investigating Adipose Tissue and Postprandial Responses Independent of BMI

**Introduction:** The increasing prevalence of obesity and cardiovascular diseases (CVD) reflects the declining metabolic health status across the general population. Traditionally measures such as body mass index (BMI), fasting blood glucose levels, HOMA-IR, and lipid profiling are used to evaluate metabolic health. However, these measures fail to capture metabolic health in lean and/or younger populations. Additionally, BMI's inability to distinguish between fat mass and lean mass has led to misinterpretations of metabolic risk across different populations. Recent studies have suggested that metabolic dysfunction involves disruptions in adipocyte signaling and adipokine secretion rather than solely on visceral adipose tissue volume (VAT).

**Objective:** This study aimed to assess adipose tissue function and postprandial metabolism in young adults classified as metabolically healthy or unhealthy, independent of BMI.

**Methods:** We conducted a cross-sectional study involving 27 young adults, ages 18-40, with a BMI range of 18.5 to 39.9. Participants were classified as metabolically healthy or unhealthy using five cardiometabolic disease risk factors: body composition, cardiorespiratory fitness, insulin resistance, glucose tolerance, and low-grade inflammation. Body composition was measured via dual X-ray absorptiometry before measuring cardiorespiratory fitness ( $\text{VO}_{2\text{peak}}$ ) via a graded exercise cycling test. Insulin resistance and glucose tolerance were determined via a 100-gram oral glucose tolerance test (OGTT). Inflammation was measured through serum C-reactive protein (CRP) levels, and adipokines (adiponectin and leptin) were measured by immunosorbent assay.

**Results:** As expected, BMI is significantly higher in young adults who are metabolically unhealthy ( $29.3 \pm 4.6$  vs.  $24.8 \pm 3.2$ ;  $p = 0.007$ ) without differences in age ( $22.6 \pm 5.5$  vs.  $24.9 \pm 4.0$  yrs.;  $p = 0.443$ ) or fat-free mass ( $55.2 \pm 10.1$  vs.  $47.4 \pm 10.1$  kg;  $p = 0.052$ ). Metabolically unhealthy individuals had significantly greater visceral adipose tissue volume ( $47.4 \pm 33.9$  vs.  $21.7 \pm 24.9$   $\text{in}^3$ ;  $p = 0.02$ ) and lower serum adiponectin ( $61.7 \pm 10.1$  vs.  $75.4 \pm 13.7$ ;  $p = 0.02$ ) than metabolically healthy young adults. Suppression of postprandial lipolysis was not significantly altered by metabolic health status ( $p > 0.05$ ) during an OGTT.

**Conclusions:** Metabolically unhealthy young adults demonstrate elevated visceral adipose tissue volumes and serum adipokine concentrations. This may indicate elevated risk for further cardiometabolic dysfunction.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### “I wish I thought about it a little bit less”: Understanding Food Resource Management and the Experience of Food Insecurity Among GW Undergrads

**Background:** In Fall 2024, 37% of students in a survey at George Washington University experienced food insecurity (FI). College students experiencing FI encounter distinct barriers compared to other populations, highlighting the need to understand their nuanced experiences accessing food to ensure the university can provide support needed to meet unmet food needs. Given the high rate of food insecurity on GW’s campus it is critical to investigate both the causes and impacts of food insecurity among the undergraduate population. The NOURISH study (Nurturing Opportunity and Understanding Resources to Improve Student Hunger) conducted in-depth interviews with GW undergraduate students to understand food insecurity and other related factors through the lens of these students’ lived experiences.

**Methods:** We purposively recruited n=22 undergraduate students, of whom n=12 were identified as experiencing food insecurity during the fall 2024 semester. Trained undergraduate research assistants completed in-depth interviews with identified students via Zoom between December 2024 and January 2025 using a semi-structured interview guide. We transcribed interviews verbatim, coded the data, and identified emergent themes.

**Results:** Preliminary thematic findings indicate that first-year students struggle more with food insecurity due to limited dining options and free spending budgets. Third and fourth-year students expressed more freedom in their dining options, which resulted in higher satisfaction with food available, overall nutrition, and dining plans. Cost and convenience emerged as the most important factors students considered when deciding what food to purchase and eat. Importantly, students with needs such as dietary restrictions and cultural preferences struggled to find adequate dining options on campus. Students, regardless of food security status, expressed difficulties with balancing academic demands, athletic demands, and eating balanced meals.

**Conclusion:** These findings highlight the need to continue to expand and reform GW Dining options on and near campus to better serve the GW student population, especially for underclassmen. Preliminary findings suggest that while many GW Dining resources exist, not all are able to fully utilize them to meet their food needs due to issues such as dining hall hours and dissatisfaction with offerings. Additionally, student supports (e.g. The Store) should be expanded to continue to address unmet food needs in partnership with GW Dining.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### From One City to Many: Strategies to Expand Healthy Corner Stores

**Background:** Healthy Corners is a DC Central Kitchen program to increase access to fresh, frozen, and fresh-cut fruits and vegetables in neighborhoods that navigate healthy food access barriers. The program expands healthy food access and variety to the community, offers benefit access programs for SNAP/WIC shoppers, and provides owners with opportunities to increase profits.

**Purpose:** This project aims to explore the feasibility of replicating DC Central Kitchen's successful Healthy Corners program in Indianapolis and the Mississippi Delta by identifying context-specific opportunities and barriers to improving access to healthy food in corner stores.

**Methods:** To understand the feasibility of replicating healthy corner stores in Indianapolis and the Mississippi Delta, we will implement two systems science approaches: Social Network Analysis (SNA) & Group Model Building (GMB). SNA maps the intricate networks of stakeholders and organizations, identifying influential actors who can catalyze change. The GMB sessions will bring stakeholders together to co-create models of their food systems. The GMB results in CLDs that provide a visual framework to help understand the complex dynamics.

**Preliminary Results:** There are no preliminary results to submit as of now.

**Significance:** This collaborative approach fosters a deeper understanding of local challenges. It empowers communities to develop tailored solutions that address their unique needs, paving the way for sustainable and impactful healthy corner store initiatives.

[This study is sponsored by the Patrick J. McGovern Foundation.](#)

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### The Perceived Impact of Food and Agriculture Service-Learning Program (FASLP) on Participant Food and Nutrition Career Interests

**Background:** Service-learning programs provide young adults with real-world opportunities targeting career interests, knowledge, and skills development. However, limited research exists examining program impact on career interests and pathways in food and nutrition-related fields. FRESHFARM FoodPrints offers a Food and Agriculture Service-Learning Program (FASLP) in Washington, D.C. that provides young adults with hands-on, practical experiences in food education with opportunities that facilitate development of knowledge and skills needed for food and nutrition-related careers. This study aims to explore service learners' perceptions of the impact of FASLP on their food and nutrition-related academic and career interests.

**Methods:** Drawing from grounded theory, this qualitative study was designed using a multiple-case study approach. Interview guide questions were developed to build understanding of participants' service-learning experience and their perceptions of its effects on their future academic and career plans. A purposive sampling strategy was used to recruit young adults active in FASLP. Semi-structured interviews were conducted with participants and were audio-recorded and transcribed. Two research team members iteratively coded interview transcripts to produce a coding framework that was applied to the entire data set. Inductive content analysis was used to identify themes that capture the effectiveness of FASLP in enhancing participants' knowledge, skills, and attitudes related to food and nutrition careers.

**Findings:** The sample (n=9) was comprised of individuals pursuing an undergraduate or graduate degree, as well as recent university graduates (89% female). Thirteen sub themes emerged from the interviews, and these were organized into 4 overarching themes: FASLP participation contributed to (1) *changes in food and nutrition academic and career interests*; (2) *knowledge and skills development*; (3) *confidence as a food and nutrition professional*; and (4) *incorporation of food and nutrition into future career pursuits*.

**Implications:** FASLP participation positively influenced service learners' interests in food and nutrition careers and their ability to navigate pursuing these pathways. Findings indicate that exposing young adults to food and nutrition careers through service-learning experiences can be a key strategy to increase candidate supply in this important field.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Improving Doctor-Patient Communication for Diverse and Low-Income Populations: Tools for More Effective Healthcare Visits

**Background & Significance:** Effective communication between healthcare providers and patients is essential for quality care, yet individuals from diverse cultural backgrounds and lower socioeconomic status (SES) often face barriers to meaningful and productive interactions with their providers. Language barriers, health literacy challenges, and systemic inequities contribute to a communication gap that can lead to poorer health outcomes, reduced adherence to treatment plans, and lower patient satisfaction. Addressing this issue is critical for promoting health equity, improving patient-provider relationships, and ultimately providing high-quality healthcare.

**Purpose:** This study investigates tools that individuals from diverse cultural and socioeconomic backgrounds use to enhance communication with their healthcare providers. The term “tools” is used broadly to consider any technological tools, interpersonal relationships, or individual practices that help people navigate the healthcare system. This study explores strategies that empower patients to feel seen, heard, and understood while ensuring they leave medical visits with a clear understanding of their condition, treatment plan, and associated factors.

**Methods:** This study employed a qualitative approach through semi-structured interviews with patients to explore barriers and facilitators of effective communication in medical settings. Before each interview, verbal or written consent was obtained, and participants were given the opportunity to ask questions about the study.

Interviews were conducted via Zoom to maintain participant confidentiality and accommodate individual schedules. Each session lasted approximately 20 minutes. Participants could skip any question or end the interview at any time without penalty.

Data collection included audio recordings of interviews, with participant consent, to ensure accuracy in transcription and analysis. Notes were taken during the interviews to supplement recorded responses. Following each interview, participants were thanked for their time and provided with contact information for follow-up inquiries.

**Findings & Conclusions:** Data collection and analysis is ongoing. Interim findings indicate that interventions such as patient education materials tailored to varying literacy levels, the use of medical interpreters, cultural competency training for providers, and patient advocacy resources can significantly improve communication outcomes. Patients who use communication tools, such as structured question guides and simplified health summaries, reported higher satisfaction with their visits and better comprehension of their treatment plans.

**Implications:** Equipping patients with effective communication tools and training healthcare providers in culturally responsive care can bridge communication gaps, leading to improved healthcare experiences and outcomes. Future research should explore implementation strategies to integrate these tools into routine clinical practice, fostering more equitable healthcare interactions for diverse and low-income populations.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Greater Fat Oxidation during Evening Mixed Meal Challenge: Meal Timing's Influence on Postprandial Metabolism

**Background:** Substrate utilization, the balance between carbohydrate and fat oxidation, shifts throughout the day in response to the intrinsic circadian phase in humans. Substrate utilization also changes in response to a meal during the postprandial phase. Given that most waking hours are spent in a postprandial state, it is important to understand how substrate utilization in the postprandial state differs in morning and evening.

**Purpose:** To compare postprandial metabolic responses to a mixed meal challenge (MMC) in healthy young adults and how timing (morning vs. evening) influences diurnal fluctuations in substrate oxidation.

**Methods:** Healthy young adults (ages 18-35 y/o; n= 7, 5 females and 2 males) free from overt pathology completed a two mixed meal challenge with indirect calorimetry, one in the morning and one in the evening. Participants were fasted 10 hours before each visit. Indirect calorimetry was conducted at baseline (fasting) and throughout the 60 and 120-minute time points following consumption of a eucaloric liquid mixed meal (Ensure Plus; 18% protein, 54% carbohydrates, 28% fat). Substrate oxidation was determined by the respiratory exchange ratio (RER). Mixed effects models were used to determine the effect of time-of-day on average RER, a measure of substrate utilization during fasting and feeding (60 and 120 minutes), while accounting for repeated measures.

**Findings:** Participants were otherwise healthy adults (BMI:  $26.3 \pm 3.6$ ; Age:  $\mu=21.4 \pm 3.9$ ). We found a statistically significant decrease in the average RER in the evening when comparing fasting and fed states in the evening vs. morning ( $p = 0.007$ ;  $-0.05 \pm 0.036$ ). There was no statistically significant change in RER when comparing fasting to 60 minutes ( $p = 0.423$ ) or 120 minutes ( $p = 0.093$ ).

**Conclusion:** Our results suggest that a eucaloric liquid mixed nutrient meal results in preferential fat oxidation among participants during evening feeding. This is potentially due to circadian influences on substrate utilization and decreased insulin sensitivity during the evening hours.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Leveraging participatory research for effective evaluation of an experiential school food education program implemented in diverse elementary schools

**Background & Purpose:** School-based experiential food education programs are a popular strategy for engaging and empowering students to make healthy food choices. These programs are rightly tailored to the context of each school community, but consistent implementation of rigorous evaluation methods across multiple sites is challenging. The FRESHARM FoodPrints program is integrated into regular school-day programming at 21 diverse public elementary schools in Washington, DC. An academic-community partnership was formed to co-create a program-wide impact and process evaluation protocol.

**Methods:** During the 2023-24 academic year, researchers and program stakeholders collaboratively designed and piloted data collection tools and methods at a purposive sample of  $n = 6$  schools representing the demographic and socioeconomic diversity of program sites. Tools to measure food literacy and fruit and vegetable (FV) intake outcomes were administered to 4<sup>th</sup> and 5<sup>th</sup> grade students at the start and end of the academic year. Data sharing protocols were established to track reach, dose and fidelity, and an interactive activity was co-developed to assess participant receptivity. Results and lessons learned were discussed and captured during regular partnership meetings and integrated into an evaluation study protocol for the 2024-25 school year.

**Findings:** Outcome measures were collected from  $n = 69$  students in Fall 2023 and  $n = 72$  students in Spring 2024 (30% participation rate). The questionnaire formats proved challenging for participant literacy levels and dietary recall abilities. Program receptivity ( $n = 222$  participants) highlighted cooking and eating as the major sources of program satisfaction. From these results, the partners developed consent processes and data collection methods for the evaluation protocol aimed at increasing the participation rate and ensuring a representative sample. Questionnaire response formats were simplified, and pictures were incorporated to improve student comprehension. Program tracking tools providing process evaluation metrics were collaboratively re-designed to yield higher quality data and greater consistency in collecting metrics across all school sites.

**Implications:** The participatory research process employed in this academic-community program partnership led to the successful development of a robust evaluation protocol that will serve specific experiential food education program needs while yielding evidence to inform best practices in experiential food education more broadly.

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# GWSPH RESEARCH SHOWCASE

# EXERCISE AND

# NUTRITION SCIENCES

## Effects of Experiential Food Education on Elementary Students' Food Literacy and Fruit and Vegetable Intake in Urban and Rural Schools

**Background & Purpose:** Experiential food education programs are a popular strategy to support children in developing healthy eating habits from a young age. Evidence is lacking however, about the effectiveness of these programs among children at the greatest risk for low-quality diets. This evaluation examines the changes in food literacy and fruit and vegetable (FV) intake over the course of a school year among 4<sup>th</sup> and 5<sup>th</sup> grade students participating in a school-based experiential food education program in Washington, DC and Frankfort, KY.

**Methods:** Eight public elementary schools with varying lengths of program exposure were recruited from a combination of urban and rural settings. All 4<sup>th</sup> and 5<sup>th</sup> grade students at each school were invited to participate. In Fall 2024, students completed food literacy and FV intake surveys designed and tested for age-appropriateness and provided anonymous demographic data (grade level and sex). The surveys will be repeated with participants in Spring 2025. Descriptive statistics, t-tests, and regression modeling will be used to examine changes in food literacy and FV intake and the association of these changes with length of program exposure, controlling for grade level, sex, and urbanicity.

**Findings:** The baseline analytic sample consists of 601 students (49.8% 4<sup>th</sup> grade, 44.1% female, 17.6% rural) from DC and KY. Based on school-level demographics, 69.3% of students were non-White, and an additional 6.9% were multiracial. In total, 88.0% of participants were enrolled at schools with a majority of students from economically disadvantaged backgrounds, and 29.6% of students were enrolled at schools adopting the food education program for the first time during the 2024-25 school year. At baseline, the average food literacy score was 82.89±9.8 out of a possible 100 points. Mean frequency of fruit and vegetables was 4.0±3.0 and 2.7±2.4 times per day, respectively.

**Implications:** The results from this evaluation will provide important insight into the effects of an experiential food education program on 4<sup>th</sup> and 5<sup>th</sup> grade students across a sample of elementary schools with high diversity between school communities. Findings can inform the development of implementation and scaling strategies that ensure future programming is contextually relevant and effective.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Serving Up Fun: Exploring Determinants that Sustain Tennis Participation Among Young Adults

**Background:** In addition to the numerous physical, mental, and social benefits tennis provides, understanding what makes it fun and engaging is essential for promoting continued participation in the sport. Previous research has examined determinants of fun in youth populations, but limited research has explored specific determinants among young adults. This study, sponsored by the United States Tennis Association, identified key determinants of fun among young adult tennis players and explored how the importance of these determinants varied by sex and primary play type, i.e., competitive compared to community players.

**Methods:** A mixed-method, community-based group concept mapping research design integrated structured brainstorming, sorting, and rating data from participants with multivariate analyses. Participants (n=1406, age 18-39 y) were recruited nationwide through online platforms, and included USTA member and non-member players. Brainstorming identified 122 unique fun determinants. Hierarchical cluster analysis was applied to the sorting data to identify main themes, i.e., clusters, among the determinants, and rating data were aggregated to determine the relative importance of each determinant and cluster. Pattern match and go-zone displays were generated to conduct subgroup comparisons across clusters and determinants.

**Results:** A nine-cluster, thematic solution was identified as the best-fitting conceptual map. Among the clusters, those of primary importance were *Skill-Based Development*, *Challenge & Strategy*, and *Ball Touches & Footwork*. Clusters of secondary importance included *Perks & Bonuses*, *Physical & Mental Fitness*, *Accessibility*, *Competition*, *Social-Based Play*, and *Community*. Across the nine clusters, comparisons by sex ( $r=0.90$ ) and play type ( $r=0.88$ ) indicated high congruence with only small effect-size differences (0.22-0.38) observed in specific clusters. Across the 122 determinants, comparisons by sex ( $r=0.93$ ) and play type ( $r=0.93$ ) also indicated high congruence.

**Conclusion:** This study is the first to comprehensively examine determinants of fun in tennis among young adults. Findings suggest consistency across sex and play type. These results highlight the importance of skill progression, physical engagement, and strategic play in fostering fun experiences that motivate continued participation in tennis for young adults regardless of sex or whether they play competitive or community tennis. Additionally, results are consistent with similar studies conducted with youth athletes in soccer, ice hockey, and basketball. These insights have broad implications for tennis program design, player retention strategies, and sport development initiatives. Future research should explore how to optimize fun for diverse subgroups, such as seniors and individuals with disabilities, to enhance long-term participation and maximize the benefits of continued participation in tennis.

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# GWSPH RESEARCH SHOWCASE

## EXERCISE AND NUTRITION SCIENCES

### Body composition and chemotherapy dose intensity in invasive breast cancer

**Background:** Black women have higher breast cancer mortality compared to White and Asian women. Reasons for this disparity are unclear, but body composition differences between Black and non-Black women that may alter tumor exposure to chemotherapy have been considered as a contributor.

**Purpose:** This study aimed to investigate whether drug dose/kilogram (kg) lean body mass (LBM) differs by race, and whether measures of LBM or adipose tissue (AT) are independently or jointly associated with chemotherapy-related hematologic toxicity and completion of scheduled treatment (RDI).

**Methods:** Women treated with doxorubicin- and taxane-containing chemotherapy regimens for invasive breast cancer at GW Cancer Center between 2012-2019 and had a staging CT scan within 12 weeks of chemotherapy initiation were included in this retrospective study. Data on planned and actual chemotherapy dose and treatment duration were abstracted from the electronic health record. L3 vertebra level CT image slices were identified by radiologists and segmented into different tissues using the Alberta protocol. Area and volume of each tissue was measured using sliceOmatic software (Tomovision, Canada, v5.0). Chemotherapy RDI was calculated for each drug individually by dividing the cumulative actual dosage received over duration of treatment by the planned dosage and duration. Multivariable logistic regression models tested for differences in drug dose/kg LBM by race and for differences in hematological toxicity and receipt of <85% RDI by kg LBM and AT measures.

**Results:** A total of 230 women met the inclusion criteria (130 Black, 80 White, and 20 Asian). Median age for Black women was 52.2 years, and 48.9 years for non-Black women. Black women had higher mean(SD) body surface area (BSA, 2.0(0.2) vs 1.8(0.2) m<sup>2</sup>, p<0.001), kg LBM (43.8(6.5) vs 40.1(5.7), p<0.001), visceral AT volume (21.2(15.2) vs 15.0(14.3) cm<sup>3</sup>, p<0.01) and subcutaneous AT volume (72.7(34.8) vs 46.0(25.7) cm<sup>3</sup>, p<0.001) than non-Black women. There were no statistically significant differences in initial or cumulative drug dose/kg LBM between Black vs non-Black women for any individual drug. LBM and AT were not associated (independently or jointly) associated with treatment-related toxicity or RDI for any individual drug, or overall.

**Significance:** Despite differences in mean BSA, LBM, and AT, chemotherapy drug dose/kg LBM did not differ by race. Differences in body composition measures between Black and non-Black women were not associated with chemotherapy toxicity or RDI<85%. Current BSA-based chemotherapy dosing regimens do not appear to contribute to disparities in breast cancer treatment outcomes among Black women.

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# Global Health

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Making Anemia Visible: Non-invasive Anemia Screening of Children under Five Years Old in El Salvador

**Background:** Anemia poses a significant public health challenge, affecting nearly 40% of children aged six to 59 months in low-resource settings. Mild and moderate anemia is often overlooked and, if left untreated, can lead to adverse developmental outcomes. Non-invasive screening technologies can provide immediate feedback to providers and caregivers, improving the detection of anemia. In 2022, the Salud Mesoamerica Initiative introduced the Rad-67™ Pulse CO-Oximeter® in child well-visits in El Salvador. An impact evaluation found that using the device increased caregivers' adherence to iron supplementation by 38% from the baseline ( $p < .10$ ).

**Objective:** To assess and explain the effects of the Rad-67™ Pulse CO-Oximeter® on providers' compliance with anemia management guidelines and caregivers' adherence to anemia treatment in El Salvador.

**Methods:** Theory-driven evaluation using a case study design. Data sources included semi-structured interviews with healthcare providers, focus group discussions with caregivers, and document review.

**(Preliminary) Findings:** Using a non-invasive anemia screening device, combined with counseling during child well-visits, raised providers' and caregivers' awareness of anemia risks and increased caregivers' adherence to treatment. Seeing test results motivated caregivers to use iron supplementation and include iron-rich foods in their feeding practices. By providing immediate feedback on anemia detection, the intervention facilitated prompt counseling and treatment by healthcare providers and adherence to treatment among caregivers. Causal mechanisms included saliency and immediacy of results, trust in the accuracy of results, and nudging that triggered expected providers' and caregivers' behaviors. Continued monitoring during follow-up visits reassured caregivers of the positive impact of their efforts, sustaining their motivation to continue treatment for their children. Nevertheless, challenges remain, particularly regarding the unpleasant taste of iron supplements; however, some caregivers have found creative ways to mask the flavor.

**Conclusion:** This intervention underscores the potential of innovative diagnostic tools to enhance the detection of anemia, facilitate timely interventions, and improve adherence to treatment in resource-limited settings. The theory-driven evaluation approach helped identify causal mechanisms that plausibly explain the outcomes reported in a prior impact evaluation. Insights from this study can inform the scaling up of the intervention in El Salvador.

*[The Gill-Lebovic Center for Community Health in the Caribbean and Latin America](#), particularly Dr. Munar, played a significant role in designing this research. The presenter is currently engaged as an alumna with the GLC in this and other ongoing research and extension activities.*

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Development of a Service User-rated Mental Healthcare Quality Assessment Tool: Findings from Theory of Change Workshops in Liberia

**Background & Significance of the Study:** The quality of mental health services in primary care and community settings remains a significant concern globally, with gaps in service delivery and limited systematic quality assessment tools. The inclusion of People with Lived Experience (PWLE) in quality assessment processes has been shown to enhance service improvements. However, there is no globally standardized tool for PWLE to evaluate mental health service quality in a competency-based manner. The development of the EQUIP-SU tool, as part of the WHO's EQUIP initiative, aims to address this gap by allowing PWLE to directly assess the quality of mental health services, providing valuable feedback to health system managers and policymakers.

**The Purpose of Your Research:** This research aimed to conduct Theory of Change (TOC) workshops in Liberia to co-create the EQUIP-SU tool with key stakeholders, including PWLE, health system managers, and policymakers. The goal was to identify key service quality metrics, align the perspectives of service users and providers, and determine ideal impact pathways for driving quality improvements through feedback captured by the tool.

**Methods:** TOC workshops were conducted with 33 stakeholders from Liberia's mental health services, including 10 PWLE, 6 caregivers, 11 mental health clinicians, and 6 health administrators/policymakers. The workshops facilitated the co-creation of a framework for assessing mental health service quality, as well as defining characteristics of what 'quality care' looks like in the target community context. Data were collected through group discussions, facilitated exercises, and stakeholder feedback to map out the desired changes and outcomes in service quality.

**Preliminary Findings & Conclusions:** The TOC workshops revealed critical insights for shaping the EQUIP-SU tool. PWLE emphasized the importance of provider communication, access to essential medications, and the privacy of consultations as key service quality indicators. Stigma, resource limitations, and gaps in provider training were identified as barriers that need to be addressed in the tool's design. The workshops also emphasized the importance of clear feedback mechanisms linking service user evaluations to actionable service improvements.

**The Implications of Your Findings and/or Revisiting the Significance of the Research:** Although still in development, the EQUIP-SU tool has been shaped by the TOC workshops to ensure that PWLE-driven assessments translate into meaningful service improvements. These workshops reinforced the potential for PWLE to play a central role in evaluating and enhancing mental health service quality. Lessons from this process will be instrumental in adapting and scaling the tool for broader use, including in Nepal and other global settings.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Efficacy of currently approved malaria vaccines in preventing the incidence and disease severity of malaria: Systematic Review and Meta-analysis

**Background:** Malaria remains a significant global health challenge with approximately 263 million cases reported in 2023. The development of effective vaccines represents a pivotal advancement in malaria prevention. This systematic review and meta-analysis evaluates the efficacy of the two currently approved malaria vaccines, RTS,S/AS01 and R21/Matrix-M, in preventing clinical malaria and reducing disease severity.

**Methods:** We conducted a systematic search of PubMed, Scopus, and CINHAL databases for randomized controlled trials evaluating RTS,S/AS01 and R21/Matrix-M vaccines. Eligible studies included human participants of any age, with outcomes including clinical malaria incidence, severe malaria cases, parasitemia, and hospitalization. Vaccine efficacy was calculated as risk ratios and converted to risk reduction. Heterogeneity was assessed using the  $I^2$  statistic, and subgroup analyses were performed based on age, vaccine type, dosing schedule, and transmission settings.

**Results:** Eight RCTs met inclusion criteria, with seven evaluating RTS,S/AS01 and one examining R21/Matrix-M. For RTS,S/AS01 in children aged 5-17 months, vaccine efficacy (VE) against clinical malaria without booster doses declined from 61% at 12-14 months to 28% at 48 months, while annual booster doses sustained efficacy above 50% through 60 months. In younger infants (6-12 weeks), RTS,S/AS01 showed lower efficacy overall. R21/Matrix-M demonstrated higher initial efficacy, particularly in seasonal transmission settings (75% against clinical malaria, 88% against severe malaria at 12 months), though efficacy was substantially lower in standard transmission areas for severe outcomes.

**Conclusion:** Both approved malaria vaccines demonstrate effectiveness in preventing clinical malaria, with distinct profiles. Annual booster doses are essential for maintaining RTS,S/AS01 efficacy, while R21/Matrix-M shows superior initial protection in seasonal settings. Vaccine selection may benefit from tailoring to transmission patterns, with R21/Matrix-M potentially more suitable for seasonal transmission zones and RTS,S with boosters for standard settings. These findings underscore the need for optimized booster schedules, next-generation vaccines, and integration with complementary interventions to enhance and sustain protection in high-transmission settings.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### A novel target of potent malaria transmission-blocking vaccine (Pfs230-D7D10)

**Background:** Malaria transmission-blocking vaccines (TBV) targeting parasite transmission in mosquitos represent a valuable public health tool for malaria control and elimination through herd immunity in community. Pfs230, a surface protein on gametocytes and gametes of *Plasmodium falciparum*, plays a critical role in gamete fertilization and further development within mosquitoes. Studies have advanced the N-terminal Pro-domain (Pro) and domain 1 (D1) of Pfs230 as a putative TBV target. Here, we report identification of an additional novel domain, Pfs230-D7D10, for the development of an effective TBV.

**Methods:** DNA vaccines and recombinant proteins encoding Pfs230-D7D10 were developed and evaluated in Balb/c mice. Antigen-specific antibody responses were assessed via ELISA. Transmission reducing activity (TRA) of antibodies induced by Pfs230-D7D10 DNA and protein (formulated in various adjuvants) were evaluated in mosquito membrane feeding assays (MFAs) using *in vitro* cultured *P. falciparum* gametocytes. In addition, we investigated functional activity of antibodies induced by DNA vaccines encoding smaller sub-domains D7 and D7D8.

**Results:** Potent D7D10-specific antibody responses were elicited in mice immunized with DNA vaccines and recombinant proteins. Anti-D7D10 IgGs purified from DNA-vaccinated mice revealed strong dose-dependent TRA against *P. falciparum* in MFAs. In comparison to Pfs230-D1-specific antibodies, D7D10-induced IgGs exhibited strong TRA even in the absence of human complement. Anti-D7D10 IgGs from protein-immunized mice similarly resulted in a dose-response TRA. Western blot analysis using various Pfs230 fragments (D 5 to D12) suggested that antibodies elicited by D7D10 DNA and protein vaccines predominantly target D7 and D8. Importantly, DNA vaccines encoding D7 and D7D8 also induced antibodies with strong TRA in MFAs.

**Conclusion:** Our studies identify Pfs230-D7D10, particularly D7, as a novel and promising TBV candidate.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Drivers of inequity in Universal Healthcare coverage in two states in Myanmar: A secondary analysis of baseline cross-sectional survey data from the Maternal Cash Transfer Program

**Background:** Acute exacerbation of Myanmar's civil conflict since the military Coup of 2021 has impeded progress towards universal healthcare (UHC) goals.

**Purpose:** Our aims are to 1) characterize inequities in UHC coverage, including those related to urban/rural/hard-to-reach (remote) areas, wealth, as well as other axes of vulnerability 2) conduct a decomposition analysis to identify the drivers of unfair inequality before the 2021 Coup.

**Methods:** A stratified cross-sectional survey was conducted in 2018 in a representative sample of mothers and children <5 years in urban, rural, and remote areas of Karen and Karenni states. Our primary outcome is the composite coverage index (CCI); our secondary outcomes include three sub-domains of the CCI and its 21 constituent indicators. Axes of vulnerability include types of area (urban, rural, remote), household wealth quintiles, maternal education, income, and distance to a health facility. Summary measures of wealth-related inequity include relative- and absolute concentration indices and achievement indices. We will use a multidimensional index of vulnerability to decompose the 2018 models to attribute proportions of inequality to the previously defined axes of vulnerability.

**Preliminary findings:** The analytic sample consisted of 1508 mothers and 2454 children <5 years. We found large inequities in utilization of health services between urban and rural areas, and between rural and remote areas. For example, compared to women in remote areas, women in rural areas reported substantially higher utilization of at least 1 ANC visit with a trained healthcare worker (96.3% rural vs 64.1% remote), institutional delivery (47% rural vs 13% remote), and full immunization for children (56% rural vs. 24% remote). Although remote vs. rural differences were partially attributable to higher rates of poverty in remote areas (89% of households in the two lowest wealth quintiles in remote areas) compared to rural areas (42% in lowest two quintiles). Concentration index numbers echoed this pattern, where wealthier quintiles experienced less inequality (institutional delivery, 0.30 rural vs 0.20 remote, and full immunization 0.08 rural vs. 0.32 remote). We found higher utilization of ANC 1 among the lower wealth quintiles in rural households (-0.26 rural) compared to higher utilization among the more wealthy in remote (0.17). However, this might be due to lower utilization of institutional delivery in these areas.

**Implications;** These findings highlight the importance of monitoring inequity in areas of active conflict.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Sociocultural Factors Associated with HIV Prevalence in Northeast India

**Background:** India has made considerable progress in tackling its nationwide HIV/AIDS epidemic since the inception of the National Aids Control Organization in 1992. However, the Northeast region has seen an increase in HIV prevalence and incidence, with five states in the region among the top 10 highest prevalence states in 2023. The region's unique sociocultural dynamics, including high rates of injection drug use, communal violence, and unique cultural landscape, necessitate more research to characterize and effectively tackle the epidemic.

**Methods:** This study uses data from the 2015-2015 National Family and Health Survey (NFHS-4) and the Uppsala Conflict Data Program to construct a hierarchical model of HIV prevalence. This model was used to analyze the relationship between various factors, such as perceptions of gender, HIV knowledge and stigma, behavior, and communal violence, and the HIV prevalence in the region.

**Results:** At the individual level, increased HIV knowledge, less HIV stigma, and fewer partners were associated with a negative HIV test result, particularly for males.

**Conclusion:** Cultural perceptions around gender and HIV knowledge play an important, but unaddressed role in HIV transmission in the Northeast region.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### A Systematic Review of FGM/C And Male Allyship: A Hopeful Future for At-Risk Women

**Background:** According to UNICEF, female genital mutilation or cutting (FGM/C) affects over 230 million girls and women globally, most commonly in Africa and Asia. Engaging men has historically improved reproductive and sexual health outcomes for women, including larger birth spacing, contraceptive usage, and maternal emotional support. However, there has been less emphasis on engaging men in specifically FGM/C eradication efforts.

**Methods:** This systematic review aims to understand men's role in propagating FGM/C and leverage this knowledge to stop the generational cycle of violence against women in regions where the practice flourishes. PRISMA quality and publication guidelines were followed, and thematic and textual narrative synthesis and analyses were completed. Articles were pulled from the databases PubMed and SCOPUS, and risk of bias was measured via the Critical Appraisal Skills Program or CASP.

**Results:** show that men (unlike women) tend to play a passive, uninvolved role in the decision-making and enforcement of FGM/C. Some men claim to believe that FGM/C should be stopped and cite sexual dysfunction and health issues with partners who are cut, undermining the commonly held belief that cutting makes a girl more attractive in the marriage market. Many men state that they had no preference for having a wife who was cut, further undermining the belief that men desire cut women.

**Conclusion:** The synthesis revealed that men, while less influential, are generally more open or neutral to ending FGM/C. Interventions focused on men can potentially reduce the prevalence and incidence of FGM/C by stopping the generational cycle. Male passivity can be used as an intervention advantage to shape social norms and ideals around women's bodies and conceptualizations of womanhood. While women are enforcers of FGM/C, men hold the authority surrounding social norms and can be capitalized upon at a programmatic level to eradicate FGM/C within communities.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Governance of Primary Health Care in Latin America and the Caribbean: Protocol for a Scoping Review and Modified Delphi Exercise to Identify Research Priorities.

**Background:** Governance is increasingly recognized as a critical determinant in the formulation and implementation of primary health care (PHC). However, research on PHC governance in Latin America and the Caribbean (LAC) remains limited, with governance often overlooked in national research agendas. This study addresses this gap by systematically mapping existing evidence developed in the region and identifying research priorities to strengthen PHC governance in the region. The research aims to improve PHC governance in LAC by addressing two key questions: (1) What formal and informal aspects of PHC governance have been empirically investigated in LAC countries implementing health reforms since 2000? and (2) What are the top ten research questions that LAC researchers and policymakers identify as priorities for strengthening PHC governance?

**Methods:** The study employs a mixed-methods approach, integrating a scoping review and a modified Delphi method. The scoping review will systematically analyze peer-reviewed and gray literature from 2000 onward, mapping empirical evidence against a conceptual PHC governance framework. This analysis will classify the findings according to formal rules and informal norms, identify gaps in evidence, and examine trends in study designs and theoretical frameworks. The modified Delphi method engages 20-25 regional experts from XX countries to refine and rank research priorities, following a structured consensus-building process. The scoring rounds apply the Child Health and Nutrition Research Initiative (CHNRI) methodology, evaluating research questions based on answerability, effectiveness, deliverability, potential impact, equitability, and timeliness.

**Preliminary Results:** A conceptual framework was developed to analyze PHC governance, incorporating actor attributes, institutions, governance arrangements, and outcomes of institutional change. Preliminary results from the scoping review indicate that research on PHC governance in LAC remains limited. The scoping review has screened 8,377 studies, identifying 48 relevant studies for inclusion.

**Significance:** The significance of this research lies in its contribution to conceptualizing governance in PHC, moving beyond normative governance models. By systematically identifying research gaps and establishing a prioritized research agenda, this study provides an evidence-based foundation for future research. The research priorities identified will be valuable for policymakers, researchers, and international organizations aiming to strengthen PHC governance in LAC. Implementation of this research agenda will require coordinated efforts from governments, academic institutions, civil society, and international partners to enhance governance mechanisms and improve PHC resilience in the region.

*[This study is sponsored by the Gill-Lebovic Center for Community Health in the Caribbean and Latin America.](#)*

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Vaccines Over Antibiotics: Saudi Arabia's Journey of Managing Pediatric Bacterial Meningitis

**Introduction:** Saudi Arabia had high rates of bacterial meningitis in the late 90s. Children are at highest risk of this devastating disease with poor outcomes.

**Objective:** The study aims to evaluate the prevalence, causative pathogens, and antibiotic resistance patterns in pediatric bacterial meningitis cases at a tertiary hospital in Riyadh, Saudi Arabia.

**Methodology:** Single-center retrospective chart review and cross-sectional methodology was conducted at King Saud University Medical City (KSUMC) from 2015 to 2023.

**Result:** Reviewing 8 years of CSF culture results only yielded 37 cases. This is only 0.5% of total hospital admissions over 8 years. The majority of cases were for children under the age of 2 years (82%). Gender of cases was almost equal and there was no seasonal variation. The most common organisms were gram-positive (14, 38%) including Group B streptococcus (GBS) (4, 11%), *Streptococcus pneumoniae* (4, 11%). Gram-negative organisms caused 8 cases (22%) by 5 different organisms. There was no *Hemophilus influenza* type B or meningococcus found in any of the CSF cultures. The single sample of *Staphylococcus aureus* was methicillin-resistant *Staphylococcus aureus* (MRSA) and three gram-negative organisms were multidrug resistant.

**Conclusion:** Saudi Arabia provides an example of the success of a mass vaccination program to curb the burden of pediatric bacterial meningitis. Future efforts should focus on antibiotic stewardship, mass screening of GBS, and adopting additional strains for the pneumococcus vaccine. Further research is needed to address the rising number of gram-negative organisms causing pediatric bacterial meningitis in Saudi Arabia and globally.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Development of a diagnostic testing algorithm for detecting dengue virus in Southern California

Environmental factors in the southern United States have increasingly become more suitable as a habitat for *Aedes aegypti*. These mosquitoes are responsible for the transmission of dengue virus (DENV), a flavivirus identified as serotypes one through four. In many people, a DENV infection may be asymptomatic; however, severity of disease ranges from an acute febrile illness to life-threatening dengue hemorrhagic fever. Although DENV is not endemic in the continental United States, local transmission is becoming more common following introduction from endemic countries and has been reported in Florida, Texas, California, Arizona, North Carolina, West Virginia, and New York.

Since 2023, Kaiser Permanente Southern California (KPSC) has conducted active serological surveillance for DENV, collecting residual blood samples from patients based on clinical and geographical criteria. Samples were tested for the presence of IgG and IgM antibodies against DENV using a quantitative serological assay. At the George Washington University, samples underwent West Nile virus (WNV) IgG and IgM testing to differentiate flavivirus cross reactivity, DENV NS1 antigen testing to identify active infections, RT-PCR to detect virus, and neutralization assays to differentiate DENV and WNV cross reactivity by their ability to neutralize respective viral activity.

A total of 1,080 samples underwent DENV 1-4 IgG and IgM testing, of which 790 positives continued to WNV IgG testing. Additionally, the 173 DENV IgM positives underwent WNV IgM, DENV NS1, and DENV 1-4 RT-PCR testing. The development of this testing procedure confirmed five active DENV 3 infections by detection of DENV 3 RNA.

As *Ae. aegypti* increasingly inhabit Southern California, the immunologically naïve population is at risk of a number of arboviruses, including DENV. Surveillance of DENV cases is not only important for symptom and case management, but also for public health practitioners to know when a travel-associated case is introduced, when transmission becomes autochthonous, and to monitor for potential outbreaks. This testing algorithm has allowed KPSC to establish an understanding of the immunological baseline in the population and promote continued testing for DENV, and further testing for travel-related surveys and DENV genotype analysis.

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# GWSPH RESEARCH SHOWCASE

# GLOBAL HEALTH

## Critical Literature Review on Governing the Commercial Determinants of Health: Mechanisms, Tools, and Collaborative Approaches

**Background:** The commercial determinants of health (CDoH) represent the systems, practices, and pathways through which commercial actors drive health and equity. Despite growing recognition of their importance, governance approaches for effectively managing CDoH remain insufficiently examined. This critical literature review aims to identify governance approaches in the CDoH field, distinguishing approaches that are promoted or criticized in existing literature.

**Methods:** We conducted a search on the PubMed and Google Scholar databases in April 2022. Further information was extracted from grey literature identified through citation searching and a review of the reference lists of identified sources. Our search strategy combined terms related to economic and commercial determinants of health, governance models, and health outcomes. English-language publications (peer-reviewed and non-peer-reviewed articles, reports, and documents) from January 2000 onward were included. The data from selected sources were extracted in a table in Excel to capture relevant information on study characteristics and findings. Using this dataset, common themes regarding governance models in the field of CDoH were identified and summarized.

**Results:** Based on the review of 118 publications, we identified two overarching CDoH governance topics: (1) CDoH governance tools/mechanisms; and (2) collaborative approaches. Public policy emerged as a widely promoted governance tool, with emphasis on market regulation, taxation, and trade policies. Industry self-regulation was consistently identified as an ineffective CDoH governance mechanism. Several publications discussed global frameworks, with the WHO Framework Convention on Tobacco Control (particularly Article 5.3) often highlighted as potential model for other industries. Civil society was recognized as crucial in CDoH governance through monitoring, litigation, and advocacy activities. The literature discussed several approaches to multistakeholder governance including Health in All Policies (HiAP), whole-of-society (WoS), whole-of-government (WoG), and public-private partnerships (PPPs). Multistakeholder governance approaches involving private actors, particularly public-private partnerships (PPPs), faced significant criticism or calls for robust accountability mechanisms.

**Conclusions:** This review of CDoH governance approaches revealed a complex landscape, with various stakeholders employing different regulatory tools and collaborative strategies. Public policy was widely promoted in the literature, while industry self-regulation was consistently viewed as ineffective. Collaborative approaches like HiAP, WoG, and WoS were generally viewed positively, but the involvement of private sector actors (particularly through PPPs) remained contentious. While many tools and collaborative approaches were discussed in the literature, there was inadequate evidence on the effectiveness of specific CDoH governance approaches and a lack of shared understanding of common terms.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Development of a Survey Tool to Measure the Commercial Influences and Behavioral Risk Factors for Non-Communicable Diseases in Bamako, Mali

**Background:** Non-communicable diseases (NCDs) account for 74% of deaths globally. The commercial determinants of health (CDoH) play a key role in the etiology of NCDs, with tactics such as marketing and pricing strategies affecting unhealthy choices and consumption behaviors. While standardized surveys exist to assess NCD risk factors, they do not comprehensively evaluate the influence of commercial practices on consumption patterns. This study describes the development and pretesting of a survey tool to assess both behavioral risk factors for NCDs and commercial influences among adults in Bamako, Mali.

**Methods:** The survey development process involved four stages: (1) development of a conceptual framework based on existing CDoH literature; (2) a rapid literature review in PubMed, Scopus, Hinari, and Google Scholar databases to identify relevant variables for the survey; (3) development of a draft survey tool incorporating questions from established instruments and questions based on variables identified in the literature review; and (4) review and revision of the survey based on expert feedback and cognitive interviews.

**Results:** The final survey tool consists of five modules covering: (1) sociodemographic characteristics; (2) sugar-sweetened beverages; (3) processed foods; (4) tobacco; and (5) alcohol. Each product-specific module includes 3 to 5 consumption questions, 4 to 5 perception/attitude questions and 10 to 12 CDoH exposure/engagement questions. The survey incorporates standardized questions from global health surveys, as well as newly developed questions to assess commercial influences. Three expert reviewers and cognitive interviews with 10 participants confirmed the survey's technical and cultural relevance, with suggestions for minor modifications to improve clarity.

**Conclusions:** This survey represents an important advancement in measuring both NCD behavioral risk factors and commercial influences in a low-income country context. By integrating established consumption measures with novel questions about commercial influences, the survey offers a more comprehensive approach to measuring NCD risk factors. The survey can serve as a model for assessing CDoH influences from the consumer perspective in other low- and middle-income countries and can inform policy decisions aimed at reducing NCD risks.

**Funding:** This work was supported by a Research Innovation Award from the Office of Research Excellence, Milken Institute School of Public Health, the George Washington University, USA in 2022 #04RIA042022.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Predicting Consumption of Sugar-Sweetened Beverages in Bamako, Mali, using Machine Learning Methods

**Background:** In Mali, non-communicable diseases (NCDs) contribute to 30% of all deaths. Commercial practices, such as advertising and pricing strategies, can influence the consumption of sugar-sweetened beverages (SSBs), which have been linked to increased NCD risk. This study aimed to investigate to what extent marketing exposure, consumer perceptions, and sociodemographic characteristics predicted consumption of SSBs in Bamako, Mali. A high-quality predictive model of the factors influencing SSB consumption can inform regulation (e.g., limitations on advertising exposure) and public health practice (e.g., identifying populations for targeted campaigns).

**Methods:** Data were collected from a cross-sectional survey of randomly sampled adults in two districts in Bamako, Mali, in 2024. The outcome of interest was the categorical variable of “any consumption of SSBs on a regular basis” (yes or no). There were 16 predictor variables (7 sociodemographic variables, 5 consumer perceptions/behaviors variables, and 4 marketing exposure variables). The dataset (n=981) was split into training (70%, n=687) and test (30%, n=294) sets. Five predictive models were implemented using the Caret package in R: Logistic Regression, Logistic LASSO Regression, Logistic Elastic-Net Regression, Random Forest, and Boosted Classification Tree. Probability thresholds were optimized to maximize the sum of sensitivity and specificity through 10-fold cross-validation. Final models were evaluated on the test set using accuracy, sensitivity, and specificity metrics.

**Results:** Approximately 90.5% (n=888) of participants reported regularly consuming SSBs. Using the test dataset, the Random Forest model had the lowest test misclassification error rate (~12.6%), but zero specificity (i.e., predicted no true negatives). The LASSO model had the second lowest test misclassification error rate (~30.3%) and the highest sum of test sensitivity and test specificity and therefore, appears to have the best performance overall. In general, model predictive performance was low, limiting our ability to draw strong conclusions about variable importance. However, across several models, wealth quintile and age appeared to be key predictor variables. Marketing exposure variables showed relatively limited predictive power, with only past 30-day exposure to advertising showing modest influence (6.8%) in the Boosted model and none being retained in the LASSO model.

**Conclusions:** Despite high overall consumption rates, predictive performance was limited across all models, with the LASSO model demonstrating the best balance of sensitivity and specificity at approximately 30.3% misclassification. Sociodemographic factors, particularly wealth quintile and age, emerged as key predictors of SSB consumption, offering potential considerations for public health approaches to address NCD risk in Mali.

**Funding:** This work was supported by a Research Innovation Award from the Office of Research Excellence, Milken Institute School of Public Health, the George Washington University, USA in 2022 #04RIA042022.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Coaching to Improve Quality of Primary Care in Honduras: Insights from A Theory Driven Evaluation

**Background:** Despite progress in service coverage across Latin America, consistent, high-quality care remains a challenge. The Coaching for Quality Improvement (C4QI) program in Honduras aimed to train mid-level managers to strengthen their managerial capabilities and embed evidence-based quality improvement (QI) into primary care services.

**Purpose of your research:** We examined what changed, how, and why, to explain how and why the intervention and its implementation context influenced providers' adherence to evidence-based cervical cancer screening and antenatal care. Study results will inform program scale-up in Honduras.

**Methods:** We conducted an explanatory case study using a theory-driven approach. To reconstruct the program theory, we reviewed policy and program documents, scoped social and behavioral science theories, and conducted 19 interviews with mid-level managers, providers, and ministry of health officials. A codebook based on the initial theory, the Actor-Based Change framework, and the COM-B behavior change model guided two-cycle coding to identify themes and map pathways of change. We used study findings to inform the refinement of the program theory and identified implications for further research and scale-up.

**Results:** Mid-level managers reported adopting new coaching, communication, and data-use skills to improve the quality of their supervision behaviors. They reported shifting from a focus on compliance checks toward mentoring providers. In turn, providers reported (1) increased commitment with quality improvement activities, (2) improved progress monitoring and patient tracking, and (3) using monitoring data to inform service improvement innovations. However, such positive outcomes were constrained by contextual conditions such as limited resources, and a broader emphasis on compliance and achieving fixed targets.

**Conclusion:** This study offers insights into how a capacity strengthening program can foster adherence to evidence-based guidelines among primary care providers. The refined program theory helped identify causal pathways and implementation strategies that will inform program scale up in Honduras.

*[This study is sponsored by the Gill-Lebovic Center for Community Health in the Caribbean and Latin America.](#)*

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Anti-MPXV IgG profiles are correlated with neutralizing antibody titers among mpox patients living with or without HIV

**Background:** Monkeypox virus (MPXV) belongs to the genus Orthopoxviruses (OPXV) in the family Poxviridae, which includes more than 80 species, including variola major virus (VARV) and vaccinia virus (VACV). Since MPXV spread outside Africa to other parts of the world in 2022, ~40% of mpox cases have been reported in the people living with HIV. However, little is known regarding dynamic changes of anti-MPXV IgG profiles and neutralizing antibody (nAb) responses among patients affected by the 2022-2023 mpox outbreaks, especially those with HIV+MPXV co-infection.

**Methods:** Herein, we determined anti-MPXV IgG profiles and nAb titers of 35 mpox patients living with or without HIV who were diagnosed with MPXV by PCR and clinical presentations. Patient sera were subjected to MPXV-specific plaque reduction neutralization test (PRNT) assay for MPXV nAb levels. High neutralization titers were determined, with PRNT50 values ranging from 1:80 to 1:160. Next, we employed a novel, xMAP (Luminex) based, 15-plex anti-OPXV serology assay to characterize individual anti-MPXV IgG profiles.

**Results:** Compared to healthy controls, the infected patients' sera yielded significantly elevated median fluorescent intensity against VARV-A36R, VACV-A27L, VACV-A33R, VACV-L1R, MPXV-A29, MPXV-A35R, MPXV-B6R, and MPXV-E8L, with anti-MPXV-A35R, anti-MPXV-B6R and anti-MPXV-E8L yielding >500-fold changes over normal cutoffs. HIV status seems not to make a difference in individual antibody or nAb tiers.

**Conclusion:** Altogether, anti-MPXV IgG profiles are correlated with mpox nAb titers in convalescent patient sera. A35 and B6 are associated with immune responses against MPXV infection.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Exploring disparities and drivers of contraceptive use among Syrian refugee youth: evidence from a mixed-methods study in Jordan

**Background:** Access to sexual and reproductive health services is an explicit element of the Sustainable Development Goals, and is critical for achieving family planning goals and broader well-being of young people. Youth (15–24 years) face many barriers to accessible, quality services, and refugees often experience additional barriers due to physical, economic, legal and/or social exclusion. This study explored these barriers in the context of Jordan – a country that has one of the highest proportions of refugees globally – by examining utilization of contraceptives by Syrian refugee status and residence (formal refugee camp, host community or informal tented settlement) and exploring predictive factors of contraceptive use.

**Methods:** This concurrent mixed-methods study utilizes the 2022–2023 Gender and Adolescence: Global Evidence data collected from 313 married female youth living in Jordan to describe utilization of family planning services by Jordanians and Syrians. Multivariable linear regression analysis and qualitative data from in-depth individual interviews and focus group discussions were then used to explore underlying factors driving differences in contraceptive utilization among Syrian refugees.

**Results:** The survey found that 63.4% of Jordanians and 42.8% of Syrian refugees were recently using family planning, with notable differences in type of contraceptive method used by both refugee status and residence. Among Syrians, living in a host community emerged as a key predictive factor of contraceptive use, as it was associated with a 19.6 percentage point increase in the likelihood of using contraception compared to those living in refugee camps. Qualitative themes nuance these findings, suggesting that living in a refugee camp where there is more restricted access to healthcare services, more salient social norms, and limited knowledge about reproductive health present barriers to contraceptive use for Syrian refugees.

**Conclusions:** These results highlight that youth-friendly reproductive health services are having mixed efficacy in Jordan. Understanding accessibility barriers to contraception should inform family planning services for marginalized groups like Syrian refugee youth. There is a need for evidence-informed efforts to expand provision of family planning counselling and access to contraceptives for young married couples in Jordan, and especially for those living in formal refugee camps.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Unveiling Cultural Dynamics and Maternal Nutrition Taboos: A Scoping Review on their Impact on Stunting in Nusa Tenggara, Eastern Indonesia

**Background:** Stunting is a significant public health issue in Eastern Indonesia, influenced by various factors, including maternal nutrition and cultural practices. Understanding how traditional dietary restrictions during pregnancy affect maternal and child health is crucial for developing effective interventions.

**Aim:** The study aims to analyze pregnant women's cultural and nutritional taboos and practices in East Nusa Tenggara through a scoping review of the scientific and grey literature and to know maternal diet factors that affect stunting prevalence in Eastern Indonesia.

**Methods:** The Scoping review analyzed twelve scholarly articles and grey literature to identify key themes related to cultural beliefs, dietary practices, health outcomes, and public health interventions. Qualitative, literature review, and quantitative studies were included to provide a comprehensive overview.

**Results:** Findings reveal that cultural taboos significantly influence dietary behaviors among pregnant women. Commonly avoided foods include certain fish, seafood, meat, and specific fruits and vegetables, most of which are consumed daily in the community. These restrictions become one of the factors, other than poverty and lack of knowledge of poor maternal nutrition, resulting in low-birth-weight infants who are at a higher risk of stunting. Despite existing interventions, more attention needs to be paid to maternal nutrition and the incorporation of cultural sensitivities into public health strategies.

**Conclusion:** Multisectoral public health intervention is needed to educate and empower women, providing them with the knowledge and resources to improve their nutritional status while respecting cultural beliefs. Addressing these cultural dynamics is essential for reducing the prevalence of stunting in Eastern Indonesia

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## GWSPH RESEARCH SHOWCASE

# GLOBAL HEALTH

### Sleeping while Queer: Impacts of sexual and gender identity-related concerns on sleep health in the LGBTQ+ community before and after the 2025 US presidential inauguration

**Background:** Sleep is essential for overall health, but disparities in sleep health exist. LGBTQ individuals experience higher rates of sleep disturbances due to discrimination, stigma, and minority stress. This study examines the impact of sexual and gender identity-related concerns on sleep health in the LGBTQ+ community before and after the 2025 US Presidential inauguration.

**Methods:** LGBTQ+ adult participants completed an online survey containing questions about sexual and gender identity-related concerns and their impacts on sleep health. Pre-inauguration responses were collected from June 2023 to September 2024. Post-inauguration responses were collected from February to March 2025. Multivariable regression was used to assess the impacts of sexual and gender identity-related concerns on sleep health pre- and post-inauguration. The survey was IRB-exempt.

**Results:** 271 members of the LGBTQ+ community completed the survey (152 pre-inauguration, 119 post-inauguration). 74% of respondents have a diagnosed sleep disorder. 94% currently experience sleep problems; of these, 98% reported that their sleep problems impact their physical, mental, and/or emotional well-being. 80% of respondents said concerns related to their gender and sexual identity may negatively impact their sleep.

Following the 2025 US presidential inauguration, there were significant increases in respondents' concerns about finding and maintaining friendships (OR 2.15,  $p=0.007$ ), employment (OR 1.90  $p=0.021$ ), housing (OR 2.04,  $p=0.043$ ), being safe in their homes (OR 3.39,  $p=0.043$ ) and in public (OR 1.87,  $p=0.013$ ), being bullied or harassed (OR 2.60,  $p=0.002$ ), having restricted civil rights (OR 3.14,  $p<0.001$ ), losing civil rights (OR 3.57,  $p<0.001$ ), and accessing health care (OR 2.36,  $p=0.002$ ).

Transgender and nonbinary respondents were also significantly more likely to have concerns about maintaining family relationships (OR 3.64,  $p<0.001$ ), finding or maintaining employment (OR 5.29,  $p<0.001$ ), accessing health care (including gender-affirming care) (OR 6.42,  $p<0.001$ ), and were significantly more likely than cisgender respondents to say their concerns have probably (OR 3.54,  $p=0.003$ ) or definitely (OR 2.63,  $p=0.02$ ) had a negative impact on their sleep.

**Conclusions:** This study finds that LGBTQ+ community members are experiencing significantly higher rates of minority stress-related sleep issues than before the 2025 US presidential inauguration. These differences may be linked to a post-inauguration increase in federal anti-LGBTQ+ policies and presidential executive orders. Overall, this study provides valuable insights into factors negatively impacting sleep health in LGBTQ+ communities following the 2025 inauguration and highlights distinct differences between the impacts on transgender and nonbinary individuals and their cisgender counterparts.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Exploration of Potential Facilitators and Barriers for Pharmacy-Based PrEP Intervention Among Black Adults in Washington, D.C.

**Background:** Pharmacy-based pre-exposure prophylaxis (PrEP) models offer an innovative way to expand HIV prevention, especially for communities facing systemic barriers to healthcare access. Washington, D.C., with persistently high HIV rates among Black adults, presents a critical opportunity to evaluate how Pharm-PrEP could meet unmet prevention needs. However, implementation of such models requires a clear understanding of social, structural, and policy-level barriers.

**Methods:** We conducted 22 in-depth interviews with a diverse group of stakeholders, including pharmacists, PrEP providers, public health officials, policy experts, and current Black PrEP users in Washington, D.C. Interviews were guided by the Consolidated Framework for Implementation Research (CFIR), and analyzed using a thematic approach in Dedoose. Coding was both deductive (based on CFIR constructs) and inductive (emerging from participant narratives), with data organized across five CFIR domains.

**Results:** Participants supported the idea of pharmacy-based PrEP, emphasizing its convenience, accessibility, and potential to reduce stigma. Key facilitators included pharmacist trust, community accessibility, and bundled services like STI testing. Barriers included limited reimbursement for pharmacists, lack of private spaces for PrEP consultations, and ongoing stigma, particularly affecting Black and LGBTQ+ clients. The need for culturally competent care, stronger community outreach, and policy changes to support pharmacist prescribing authority were emphasized. A conceptual model was developed to illustrate how these multilevel factors interact to influence implementation.

**Conclusion:** Pharm-PrEP has the potential to improve HIV prevention equity by reaching underserved communities in more accessible, familiar settings. However, effective implementation requires addressing financial, infrastructural, and cultural barriers. These findings offer actionable recommendations for public health officials, pharmacy systems, and policymakers committed to expanding PrEP access and reducing HIV disparities.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Evaluation of Measles and Rubella Elimination Progress in Bangladesh

**Background:** Measles and rubella are highly infectious but vaccine-preventable diseases that still cause considerable morbidity and mortality globally, disproportionately among infants and children. Bangladesh, one of the largest countries in the WHO South-East Asia Region, is still endemic for measles and rubella. This study reviews Bangladesh's measles and rubella elimination (MRE) progress, identifies gaps in MRE surveillance and program performance, and provides recommendations to help them reach their goal of elimination by 2026.

**Methods:** Bangladesh's case-based surveillance system data provided by the WHO South-East Asia Regional Office was analyzed from 2020 to 2024. Descriptive epidemiologic factors associated with measles and rubella cases were identified and surveillance quality was assessed through standard indicators. Data were cleaned and analyzed in Excel, SAS, and ArcGIS.

**Results:** There were 28,970 suspected cases investigated from 2020 to 2024. Measles incidence decreased from 1.63 per million population in 2023 to 1.31 per million population in 2024, and rubella incidence decreased from 1.06 per million population in 2023 to 0.52 per million population in 2024. There were 4 measles outbreaks and 1 rubella outbreak in Bangladesh in 2024. Genotype data was not available for any of the cases in the dataset. All surveillance performance indicators met WHO targets, except for molecular surveillance.

**Conclusion:** While Bangladesh has made substantial MRE progress over the last several years, they still face circulating cases and other challenges to reaching elimination by 2026. Recommendations include enhancing laboratory capacity, improving molecular surveillance, and collecting more genotype data to identify chains of transmission.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Accountability and transparency arrangements in the primary healthcare systems of Latin American and Caribbean countries: An evidence gap map.

**Background:** Strengthening transparency and accountability (T&A) has become a priority in international development and health, with increased accountability linked to improved health system efficiency, reduced corruption, and greater responsiveness to public health needs. In Latin America and the Caribbean (LAC), health system reforms since the 1990s have increasingly emphasized democratization, incorporating rights-based approaches and social participation. However, translating these principles into practice remains an ongoing challenge. This research assesses the existing evaluative literature on T&A in primary health systems in the region, with the aim of identifying gaps to inform future research.

**Methods:** An evidence gap map (EGM) approach was used which is a systematic review of the available evidence related to an intervention. A conceptual framework was developed to guide the search strategy and data extraction process. Grey and peer-review literature related to T&A interventions in the LAC region from 2004 onwards were included if they used quantitative impact evaluation approaches or a sub-set of evaluative qualitative approaches. The search was conducted in April 2024 in Spanish, English, French, and Portuguese across Scopus, MEDLINE, and region-specific databases. All data were screened and extracted to identify the outcomes assessed by each paper.

**Results:** A total of 4,492 studies were screened with 12 studies included for data extraction. Included studies came from eight countries with six including data from Brazil. More studies focused on T&A interventions internal to the health system, such as audit and feedback, as compared to citizen voice focused T&A interventions. The most assessed outcomes were related to health care quality, utilization, and accessibility.

#### Conclusions:

Actionable evidence related to T&A in the LAC region remains sparse. A key challenge to assessing the evidence is the diversity of interventions included under the umbrella of T&A and the multi-component approach of many of the interventions. While much T&A work is being done, there is a need to expand the evidence base to more of the region and push beyond descriptive analyses, including to more qualitative and mixed-methods causal impact evaluations that capture the interplay of intervention and context. Ultimately, improving the evidence base for T&A mechanisms can contribute to more resilient, equitable, and effective PHC governance across the region.

*This study is sponsored by the Gill-Lebovic Center for Community Health in the Caribbean and Latin America.*

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Developing a Process Implementation Plan for FRESH: A Restaurant-Based intervention in Washington, DC and Baltimore

**Background and objective:** Americans increasingly rely on prepared food sources for their meals, yet policymakers have few tools to virtually test strategies to intervene in these settings. The FRESH (Focus on Restaurant Engagement to Strengthen Health) study works with independently owned restaurants in DC and Baltimore to refine, implement and test a novel intervention that aims to sustainably improve access to and promotion of healthier foods.

**Methods:** This study employs structured process indicators to monitor intervention implementation through a multi-phase methodology. The indicators will provide insights into restaurant participation, utilization of promotional strategies, and adoption of healthier menu options, demonstrating how each component contributes to system science.

**Study design and data collection:** During delivery of the FRESH intervention, we will: collect qualitative and quantitative data on the implementation of the FRESH intervention (in 24 independently owned restaurants). Using a theory driven logic model, these data will include: dose delivered by interventionists (tracking intervention components); dose received (extent to which (owners/staff) received intervention components); reach (proportion of owners/staff exposed to intervention components); fidelity (extent to which intervention components were delivered as intended and align with FRESH process standards); and detailed interventionist notes of challenges and lessons learned.

**Implications:** These data will be used to develop a simulation model for stakeholders to allow them to virtually test the effects of similar intervention strategies in the context of their own urban communities.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Self-Sampling for Cervical Cancer Screening in Low- and Middle-Income Countries: A Scoping Review of Current Practices, Gaps, and Adaptation Potential for Colorectal Cancer

#### Background:

Cervical and colorectal cancers pose significant public health challenges globally, with a disproportionately high burden in low- and middle-income countries (LMICs) due to limited access to preventive screening programs. Self-sampling for cervical cancer screening, particularly through mail-based return methods, has emerged as a promising strategy to overcome barriers related to healthcare access, cultural stigma, and logistical constraints. While widely implemented in high-income countries (HICs), the feasibility and effectiveness of self-sampling in LMICs remain underexplored. Additionally, the potential for adapting self-sampling strategies for colorectal cancer screening in LMICs is not well understood.

#### Objective:

This scoping review aims to map current practices, identify gaps, and assess the adaptation potential of self-sampling methodologies for cervical and colorectal cancer screening in LMICs.

#### Methods:

A systematic search was conducted in PubMed, CINAHL, and Scopus for studies published between 2014 and 2024. Eligible studies included case reports, systematic reviews, and intervention studies focusing on self-sampling for cervical and colorectal cancer in LMICs. Data extraction and synthesis were performed using Covidence software, following PRISMA guidelines.

#### Results:

A total of 21 studies met the inclusion criteria, comprising 521,095 participants across various LMICs. Findings suggest that self-sampling significantly increases screening uptake, particularly among underserved populations. However, logistical barriers such as sample return methods, healthcare infrastructure limitations, and provider engagement remain critical challenges. While mail-based self-sampling has demonstrated feasibility in HICs, its implementation in LMICs requires tailored strategies to address postal system reliability and follow-up care. Furthermore, emerging evidence supports the adaptation of self-sampling for colorectal cancer screening, though further research is needed to assess its effectiveness in resource-limited settings.

#### Conclusion:

Self-sampling presents a viable approach to improving cervical cancer screening coverage in LMICs, but its scalability is dependent on overcoming infrastructure and cultural barriers. The adaptation of self-sampling methodologies for colorectal cancer screening warrants further exploration to enhance early detection and reduce cancer-related disparities in LMICs.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Bili-ruler: A low-cost icterometer for newborn jaundice screening in community settings

**Background:** Neonatal jaundice (NNJ), or accumulation of bilirubin molecules in blood, affects 60-80% of newborns. Severe cases can lead to brain damage and death, and NNJ ranked 7<sup>th</sup> in cause of neonatal deaths in Asia and Africa. All babies should be screened for jaundice in their first few days of life. In low-and-middle-income-countries (LMICs) like Pakistan, identification of at-risk neonates becomes challenging due to the large number of home births, and much of healthcare financing is paid out-of-pocket. Thus, visual inspection of newborn skin is common but inaccurate, and portable devices and laboratory tests are too expensive for regular screening.

Bili-ruler is a low-cost (\$10 USD) ruler with six shades of yellow, which could enable simple, low-cost screening of NNJ with high sensitivity in community settings.

**Methods:** This is a sub-study nested within the PRISMA study, a prospective open cohort study that enrolls mothers and newborns in five LMICs and seeks to understand pregnancy risk factors and adverse maternal and neonatal outcomes. In this sub-study, infants born to mothers enrolled in the PRISMA study in Karachi, Pakistan will be evaluated at four time points: at birth, 3-5 days, 5-7 days, and 7-14 days of life. Newborns will be evaluated for jaundice using Bili-ruler; skin tone will be measured using the Monk skin tone scale, a ruler with ten shades of tan to brown that provides a semi-quantitative estimate of skin tone. Visual inspection and transcutaneous (skin-based) bilirubin (TCB) estimation already occur in the PRISMA study; we will evaluate the sensitivity and specificity of Bili-ruler compared to these methods. We will also evaluate inter-rater reliability of Bili-ruler between two users measuring the same infants.

**Results:** Data collection began in October 2024. As of March 2025, 395 newborns have been enrolled and > 1000 Bili-ruler measurements taken. 866 (80%) Bili-ruler measurements taken by two users (n=1078) match exactly, while 1076 (>99%) differ by 1 point, indicating that Bili-ruler is easy to use; only 2 measurements (< 1%) differ by 2 or more points. A Bili-ruler reading of 2.5 has a sensitivity of 97% and specificity of 51% for detecting a TCB of 15 mg/dL, a value considered indicative of follow-up care.

**Conclusion:** Bili-ruler can be effective for screening of neonatal jaundice in community settings. Further data collection and analysis is needed to evaluate these results based on gestational age and skin tone, two covariates that are known to affect bilirubin measurement.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Hemoglobin Across Pregnancy and Birth Outcomes: Evidence for Timing-Specific Effects from a Tanzanian Cohort

**Background:** Maternal hemoglobin levels influence pregnancy outcomes, yet the role of timing remains unclear. This study examines the association between early and late pregnancy hemoglobin levels and birth outcomes, including preterm birth, birthweight, and small-for-gestational-age (SGA), among pregnant women in Tanzania.

**Methods:** We conducted a secondary analysis of the Tanzania site of the Non-inferiority of Lower Dose Calcium Supplementation During Pregnancy trial. Maternal hemoglobin was measured at enrollment (<20 weeks' gestation) and at ~32 weeks. Primary outcomes included preterm birth (<37 weeks), birthweight, and SGA (<10th and <3rd percentile by INTERGROWTH-21st). Log-binomial regression estimated relative risks for categorical outcomes, while linear regression modeled birthweight. Models adjusted for BMI, wealth, education, HIV status, and baseline hypertension.

**Results:** Every 1 g/dL increase in early pregnancy hemoglobin was significantly associated with a 5% reduced risk of preterm birth (adjusted RR 0.95, 95% CI 0.91-0.99) but was not associated with SGA (10th percentile adjusted RR 1.00, 95% CI 0.98-1.04; 3rd percentile adjusted RR 1.02, 95% CI 0.98-1.08). Birthweight showed a positive but non-significant association with early pregnancy hemoglobin (adjusted MD = 21.30 g, 95% CI -4.19 to 46.80). Late pregnancy hemoglobin was also inversely associated with preterm birth (adjusted RR 0.93, 95% CI 0.88-0.98), with no significant associations for SGA or birthweight.

**Conclusions:** Higher maternal hemoglobin in both early and late pregnancy was protective against preterm birth but showed no clear relationship with SGA or birthweight. These findings suggest that hemoglobin's impact on pregnancy outcomes may be timing-specific and emphasize the need for further research on optimal hemoglobin levels throughout gestation.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Challenges and Barriers to developing a Zika vaccine candidate, the road to prevention.

**Background:** This review aims to update the descriptive epidemiology of Zika virus, explore its socioeconomic burden, identify risk factors for transmission, and analyze challenges in developing a Zika virus vaccine. The review also highlights the current understanding of the host immune response and evaluates the status of vaccine candidates in clinical trials.

**Methods:** MEDLINE (Ebsco) and PubMed were used in this systematic review as primary databases to search for relevant peer reviewed journals articles, supplemented by opportunistic searches to fill information gaps revealed during the review.

**Results:** Zika causes congenital syndromes and Guillain-Barre Syndrome, a devastating burden on effected families. Estimated socioeconomic burden of Zika virus exceeds USD\$350 million, which would require an allocation of long-term foreign aids to support preventive measures. Zika virus has Asian and African lineages. Risk factors for further Zika virus transmission to regions such as Sub-Saharan, Africa, South-East Asia, and Western Pacific include climatic, poor sanitation, and high population density. Twenty-nine vaccine candidates with double blinded randomized clinical trial study design (RCT) were identified, with 22 candidates currently in RCT Phase I trials and 10 candidates having completed this phase. Among three candidates in RCT Phase II, two have completed these trials. No candidates are in RCT Phase 3 studies. Of the 29 vaccine candidates the inactivated platform approach is the most frequently used. One candidate modified ZIKV prM-E-LNPs in RCT Phase II is using mRNA technology. Challenges in vaccine development include a shortage of trial participants and the need for specialized laboratory equipment.

#### Conclusions:

Candidates using mRNA and DNA platforms are most likely to progress into RCT Phase 3 studies. One promising candidate, mRNA-1893 received fast track designation by FDA for expedited drug approval. Among factors to enhance economic benefits of a new vaccine, an affordable vaccine price and >50% vaccine efficacy are essential.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Growth Outcomes in Neonates and Infants Born to Mothers on Bictegravir During Pregnancy

**Background:** Bictegravir (BIC) is a recommended first-line antiretroviral (ARV) drug for most adolescents and adults living with HIV. Despite its growing use in pregnancy, data on its safety and impact on infant growth outcomes remain limited and BIC remains an alternative ARV during pregnancy. We examined health outcomes among HIV and BIC *in utero* exposed infants (HBEI) evaluated at Children's National Hospital (CNH).

**Methods:** A retrospective cohort study of HBEI who received care at CNH from January 2019 through 2022. Data were collected from infant medical records (birth outcomes, HIV status, growth indicators) and maternal intake forms (demographics, HIV diagnosis duration, viral load (VL) before delivery, BIC treatment initiation and duration). Descriptive statistics were used to analyze infant head circumference (HC) at 0–1 month and weight-for-length (WFL) and length-for-age (LFA) at 2–3 months using CDC-recommended z-score standards. Infants were deemed definitively HIV negative based on  $\geq 2$  negative HIV NAT tests after 1 and 4 months of age.

**Results:** Sixty mothers (median age=34 [IQR:26–37], 50% African American, 70% with VL <50 copies/mL and median CD4 count of 450 cells/mm<sup>3</sup> [IQR:380–663] pre-delivery) delivered 60 HBEIs (88% born at term, median birth weight=3.2 kg [IQR 2.8-3.4]). BIC initiation occurred prior to or during first trimester (46%), during the second (18%) and third (10%). Forty-four mothers (73%) continued BIC through delivery, six (10%) discontinued in the first trimester, and 10 (17%) had an unknown BIC duration. Growth parameters were primarily normal for HC at 0–1 month (n=49, 92%) and at 2–3 months for WFL (n=52, 85%) and LFA (n=51, 92%). Abnormal growth outcomes included microcephaly (2%) and macrocephaly (6%) for HC, underweight (4%) and overweight (12%) for WFL, and short stature (6%) and tall for age (2%) for LFA. Among 60 HBEIs, 57 (95%) were definitively HIV-negative; three (5%) low-risk HBEIs were lost to care.

**Conclusion:** Most HBEI exhibited normal growth, contributing to the growing body of evidence on BIC use during pregnancy for infant outcomes. Additional larger cohorts and comparative studies are needed to assess long-term growth and developmental implications of ARV exposures *in utero*.

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# GWSPH RESEARCH SHOWCASE

## GLOBAL HEALTH

### Quality of Antenatal Care and Perinatal Outcomes: Evidence from a Cohort Study in Ethiopia, Kenya, South Africa, and India

**Background:** Antenatal care (ANC) is crucial for ensuring the health of pregnant women and their newborns. Global ANC coverage has improved; however, ANC quality remains suboptimal. Evidence on the association between ANC quality and perinatal outcomes in low-resource countries is still limited. Hence, this study assessed ANC quality and its relationship with fetal loss and low birth weight (LBW) newborns.

**Methods:** We used data from the eCohort study that collected longitudinal data on ANC utilization and quality until the end of pregnancy across eight sites in Ethiopia, Kenya, South Africa, and India. Primary outcomes included fetal loss ( $\geq 13$  weeks of gestation) and LBW. Good quality ANC was defined as receiving six essential care components at the first ANC visit: blood pressure measurement, blood and urine tests, ultrasound, iron and folic acid supplementation, and counseling on pregnancy danger signs. We conducted mixed-effect logistic regressions to assess the association between good quality ANC and perinatal outcomes, with a sensitivity analysis where good quality ANC excluded ultrasound scans.

**Results:** Among 3,597 pregnant women followed until the end of pregnancy, only 5.8% received all six essential care components during their first ANC visit (ranging from 1.4% in India to 14.0% in Ethiopia). The receipt of ultrasound scans at their first visit varied significantly, from only 7.6% in South Africa to 43.4% in Ethiopia. Fetal loss prevalence was 3.7% in Ethiopia, 3.8% in Kenya, 4.0% in South Africa, and 6.0% in India. India and South Africa had higher rates of LBW newborns (among neonates who were alive at the time of the survey): 16.3% and 13.1%, respectively, compared to 8.6% in Ethiopia and 8.5% in Kenya. Multiple pregnancies were commonly undetected at the first ANC visit. Good quality ANC was associated with a lower risk of fetal loss (RR 0.42, 95% CI 0.10 – 0.73), and the association remained significant when good quality ANC excluded ultrasounds (RR 0.68, 95% CI 0.45 – 0.92). No significant associations were observed between good quality ANC and LBW.

**Conclusions:** This study identified important gaps in ANC quality and found that receiving essential ANC services was associated with a lower risk of fetal loss. With increasing global ANC coverage, future research should continue assessing quality, and programs should prioritize quality improvement, ensuring the delivery of good clinical practice and evidence-based interventions in pregnancy.

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# Health Policy and Management

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# GWSPH RESEARCH SHOWCASE

## HEALTH POLICY AND MANAGEMENT

### Mixed-Methods Findings And Implications From HRSA Grantees On Addressing Health Workforce Burnout And Moral Injury

**Background & Significance:** The *Dr. Lorna Breen Health Care Provider Protection Act* was the first explicit federal program designed to improve mental health and address burnout in health workers. Related to this Act, Congress provided \$120 million to the Health Resources and Services Administration (HRSA), who in 2021 awarded 3-year grants to 44 organizations. We conducted a summative examination of grantees' activities, program outcomes, and major takeaways from the grant experience.

**Purpose:** This study explores the 3-year grants' impact and lessons learned for broader efforts to improve health worker well-being in the United States.

**Methods:** This mixed-methods study, fielded to all active HRSA grantees (N=42) in Fall 2024, included a quantitative survey and qualitative focus groups. Half of grantee teams (n = 21) responded to the survey, which gathered descriptive data regarding each grantee's activities, outcomes, and plans for sustainability. For focus groups, 28 participants representing 27 grantee teams (64%) participated, providing qualitative data on the collective experiences and insights of the entire grantee cohort. Descriptive methods were used to analyze survey data, and inductive thematic analysis was used to analyze the focus group data.

**Findings & Conclusions:** Wellness training was the most prevalent grant activity, reported among 19 of the 21 survey respondents. Survey respondents largely described their programs as effective, with half or more reporting positive changes in their target population's mental health, resilience, burnout, and job satisfaction. However, many activities were reported as requiring a high level of effort and struggled to be institutionalized. Focus groups revealed a rejection of "resilience" as the dominant workforce well-being framework, explained the shortcomings of wellness programs in the context of necessary organizational change, and spoke about the need for worker-responsive, co-designed well-being solutions. Focus group participants also described their successes in changing organizational culture but noted a disconnect between the necessary versus existing accountability structures for worker well-being. In conclusion, the federal funding enhanced grantees' capacity to implement workplace wellness programs and highlighted the importance of relational strategies to build trust among workers, leaders, and organizations to address the root causes of burnout and moral injury.

**Implications:** To systemically improve health workforce well-being, policies and practices must prioritize organization-level changes that foster environments where workers can thrive. This includes implementing relational strategies to build trust, as well as aligning individual wellness initiatives with systemic organizational support.

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# GWSPH RESEARCH SHOWCASE

# HEALTH POLICY AND

# MANAGEMENT

## Association Between Medicare Plan Types and Self-perceived Mental Health Outcomes in Older Adults with Diabetes: An Analysis Utilizing the Medical Expenditure Panel Survey

**Background:** Care fragmentation can lead to poor treatment outcomes, undermining the efforts of chronic care management and particularly increasing the risk of comorbidities. The introduction of Medicare Advantage (MA) facilitates managed care through private health plans as opposed to traditional fee-for-service Medicare (TM). Given that diabetes affects 20% of Medicare beneficiaries and imposes a greater financial burden on these individuals compared to their non-diabetic counterparts, it is crucial to explore the implications for comorbidities in chronic disease management. While MA has demonstrated lower healthcare utilization and better patient experience, the impact on health status remains unclear or inconsistent. Therefore, this study aims to investigate disparities in self-perceived mental health status—an important comorbidity in chronic disease management—among elderly Medicare beneficiaries with diabetes, comparing those enrolled in TM to those in MA.

**Methods:** Data for this analysis were drawn from the MEPS HC-233 2022 Full Year Consolidated Data File. This cross-sectional study employs Propensity Score Weighting (PSW) to evaluate self-perceived mental health status using two validated instruments: the Kessler 6 Psychological Distress Scale (K-6) and the Patient Health Questionnaire-2 (PHQ-2). The primary predictor of interest is the enrollment status in TM versus MA. To ensure robust results, weighted regression analyses and PSW utilizing inverse probability weighting (IPW) methods were implemented, controlling for key variables such as age, gender, race, income level, insurance status, self-perceived physical health, and census region. Furthermore, comparative analyses involving interaction terms were implemented to examine whether MA and TM programs had differential effects on psychological distress in diabetic beneficiaries relative to non-diabetic beneficiaries.

**Results:** The findings revealed no statistically significant differences in mental health status between elderly beneficiaries aged 65 and older enrolled in TM versus those in MA with diabetes. Furthermore, enrollment in either TM or MA did not significantly influence the mental health outcomes among diabetic and non-diabetic beneficiaries.

**Implications for Policy:** Although differences in care accessibility and demographic distributions between TM and MA plans are often discussed, our findings suggest that patient outcomes may be comparable across these groups. With comparable enrollment rates between the two groups and the growing enrollment in MA plans, it can be inferred that MA beneficiaries experience clinical outcomes similar to those in TM due to the care pattern and practice changes. Therefore, the favorable selection from the insurer or beneficiary side may not be significant contemporarily.

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# GWSPH RESEARCH SHOWCASE

## HEALTH POLICY AND MANAGEMENT

### Outcomes of a randomized controlled trial testing the feasibility, acceptability and preliminary efficacy of a digital, coach-assisted intervention to enhance hope and quality of life among young adult cancer survivors

**Background and Significance:** The increasing number of young adult (YA) cancer survivors underscores the need for psychosocial interventions, which have been limited in scalability and their focus on mental health symptoms.

**Purpose:** We tested ‘Achieving Wellness After Reaching the End-of-treatment’ (AWARE), an 8-week digital, coach-assisted intervention to promote hope and quality of life (QOL) in YA survivors.

**Methods:** A 2-arm RCT compared AWARE vs. attention control (AC) among 155 YA survivors (ages 18-39;  $M_{age}=32.89$ , 87.7% female, 8.4% Hispanic, 22.6% racial minority) within 3 years post-treatment, all recruited online. Primary outcomes were feasibility and acceptability; we also assessed preliminary efficacy on hope and QOL at baseline, end-of-treatment (EOT), and 16-week follow-up (FU).

**Findings and Conclusions:** Both conditions showed high retention at EOT (94.2%; AWARE: 94.9% vs. AC: 93.5%) and FU (94.8%; AWARE: 96.2% vs. AC: 93.5%) and session completion ( $\geq 75\%$ ). AWARE (vs. AC) participants reported greater program recommendation (90.5% vs. 83.3%), satisfaction ( $M=4.16$  vs.  $M=3.68$ ), and helpfulness of the educational recordings/transcripts ( $M=4.07$  vs.  $M=3.69$ ), reflections ( $M=4.18$  vs.  $M=3.39$ ), and coaching ( $M=4.15$  vs.  $M=3.46$ ,  $p<.05$ ). AWARE participants provided positive comments about program concepts/components and suggested additional content (e.g., fear of recurrence), application opportunities, and peer/group involvement. Multivariable regression showed no associations between condition and hope or QOL; however, AWARE (vs. AC) showed greater effects on those with lower baseline hope, and bivariate showed AWARE’s unique effects on hope’s pathways and certain QOL dimensions at FU.

**Implications/Significance:** Feedback on AWARE was positive; yet, intervention revisions or greater focus on those with lower hope may enhance AWARE’s utility in promoting hope or QOL. Results underscore the importance of continued efforts to target hope and QOL among YA survivors.

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# GWSPH RESEARCH SHOWCASE

# HEALTH POLICY AND

# MANAGEMENT

## Assessing the Impact of Affirmative Action and Anti-DEI Policies on Diversity in Health Professions Education

**Background & Significance:** The June 2023 Supreme Court decision ending race-conscious admissions, along with a wave of state-level legislation restricting Diversity, Equity, and Inclusion (DEI) initiatives, poses a significant threat to efforts to diversify the health workforce. A diverse health professions pipeline is essential for addressing health disparities and improving outcomes for underserved populations. However, anecdotal reports and inconsistent data reporting from institutions make it difficult to assess policy impacts systematically. Rigorous, cross-professional, and cross-state analysis is urgently needed.

**Purpose:** This project, led by the Fitzhugh Mullan Institute for Health Workforce Equity, seeks to evaluate the impact of the 2023 SCOTUS decision and anti-DEI legislation on racial and ethnic diversity in medical, dental, and physician assistant (PA) education programs. The study asks: How have these policies affected underrepresented minority (URM) application and matriculation rates? How do these effects vary across state policy environments and institutional characteristics?

**Methods:** The full study will use national application and first-year enrollment data from centralized application services (ADEA, AAMC, AACOM, PAEA), combining descriptive statistics with difference-in-differences (DiD) regression models. DiD analyses will compare (1) states newly affected by the 2023 SCOTUS ruling with those that had pre-existing affirmative action bans and (2) states that enacted anti-DEI laws with those that did not, using a staggered adoption framework. Institutional characteristics such as public/private status, Hispanic Serving Institution (HSI) designation, and Historically Black Colleges and Universities (HBCU) designation will also be examined. All analyses will be conducted in Stata 18, with appropriate fixed effects and clustered standard errors.

**Preliminary Findings:** To date, only descriptive analyses using Excel have been conducted, and only dental program data have been received. A year-over-year comparison shows a small decline in URM dental first-year enrollment in states without prior affirmative action bans (22.85% in 2023–24 to 22.38% in 2024–25) and a larger decline in states with prior bans (20.75% to 19.47%). HBCUs and HSIs saw increases in URM dental enrollment in AY 2024-25, while public institutions gained slightly and private institutions declined.

**Implications:** These early findings suggest potential erosion of recent diversity gains in dental education following the *Students for Fair Admissions, Inc. v. President and Fellows of Harvard College* and *Students for Fair Admissions, Inc. v. University of North Carolina* decisions. Minority-serving institutions appear more resilient. As more data become available, this work will guide strategies to maintain diversity in health education—a critical public health priority.

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# GWSPH RESEARCH SHOWCASE

## HEALTH POLICY AND MANAGEMENT

### The Absence of Standardized Perinatal Bereavement Response in the United States: A Call for National Implementation

**Background:** Perinatal loss is a traumatic event affecting approximately 24,000 U.S. families annually due to stillbirth alone. Despite its psychological and emotional impacts, the U.S. lacks a standardized national response to perinatal bereavement care. This results in inconsistent hospital practices, inadequate provider training, and inequities in support for grieving families. Countries like the United Kingdom and Australia have implemented structured, nationwide bereavement frameworks, but no federally endorsed model exists in the U.S. This literature review aims to identify gaps in U.S. bereavement care, examine global models, and assess the need for national standardization.

**Methods:** A literature review was conducted to assess the current landscape of perinatal bereavement policies. Inclusion criteria focused on studies published within the past ten years discussing bereavement protocols, healthcare provider training, and family support after perinatal loss. Comparisons were made to international models with established national guidelines.

**Results:** Studies indicate that parents who receive structured bereavement care experience lower rates of prolonged grief disorder and PTSD symptoms. Findings reveal significant inconsistencies in perinatal bereavement support across U.S. hospitals, with care often depending on individual provider training rather than standardized policy.

Despite advocacy efforts from organizations, no national U.S. mandate exists to standardize perinatal bereavement care. In contrast, other countries ensure comprehensive training and hospital-wide implementation, leading to improved parental outcomes and healthcare provider confidence in delivering bereavement care.

**Conclusion:** The absence of a standardized bereavement care policy in the U.S. results in inequitable and insufficient support for grieving families. International models demonstrate the effectiveness of standardized bereavement frameworks, underscoring the need for a federally implemented system in the U.S. Policymakers and healthcare organizations must prioritize developing national guidelines to ensure all families experiencing perinatal loss receive compassionate, evidence-based and culturally relevant care.

A standardized perinatal bereavement response is essential to reducing disparities in care, improving mental health outcomes for bereaved parents, and enhancing healthcare provider preparedness. Federal action is needed to implement nationwide guidelines, ensuring equitable access to bereavement care for all families.

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# GWSPH RESEARCH SHOWCASE

# HEALTH POLICY AND MANAGEMENT

## A literature review on the barriers to integrating public health and healthcare

**Introduction:** As the need for integrating public health and healthcare increases, understanding the gaps and challenges in coordination between the two sectors becomes more critical. The aim of this study was to conduct a literature review of barriers and opportunities to increase integration between public health and healthcare in the United States.

**Methods:** The research databases PubMed, Scopus, and ProQuest Policy File Index were searched. Barriers to integration and opportunities to close the collaboration gap were identified through analysis of the included articles.

**Results:** Of the 1069 results identified through the search, 42 articles were included. The following barriers emerged: data sharing and infrastructure challenges, institutional and structural obstacles, cultural and operational misalignment, and resource and capacity constraints.

**Discussion:** This literature review demonstrates the theoretical and practical barriers to implementing integration. It is notable that the barriers identified are interconnected and influence the existence of each other. This suggests that solutions to closing the coordination gaps involve comprehensive approaches that target substantial and ancillary challenges. The opportunities presented to bridge the coordination gaps include develop a comprehensive strategy to coordinate data systems, resolve institutional differences and establish shared governance early in cross-sector partnerships, broaden the scope of work of partner organizations, and prioritize strong consistent funding and workforce development.

**Conclusion:** To ensure sustainable integration practices between public health and health care, barriers must be acknowledged and addressed comprehensively by relevant stakeholders. Successful integration will require coordinated action across all levels—federal, state, and local—with particular attention to rural and underserved areas where resource constraints are most severe. Future research may benefit from exploring the barriers in greater depth.

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# GWSPH RESEARCH SHOWCASE

# HEALTH POLICY AND

# MANAGEMENT

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## Implementing a Patient Navigation System in Puerto Rico to Decrease Cervical Cancer Rates

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**Background:** Cervical cancer affects 11.4 individuals per 100,000 in Puerto Rico, compared to 7.4 per 100,000 individuals in the United States.<sup>1</sup> Factors contributing to this disparity include delays in prevention, screening, and treatment, exacerbated by a complex and fragmented healthcare system. Many individuals feel uninformed and overwhelmed regarding how or where to access services. In the United States, patient navigation systems have proven effective in improving early screening and detection in underserved communities.<sup>2</sup> However, no such system has been implemented in Puerto Rico. This study proposes the development of a patient navigation system to improve early screening and detection and reduce cervical cancer rates in Puerto Rico.

**Methods:** A literature review was conducted on successful patient navigation systems across United States to assess their effectiveness in improving early screening and detection. Additionally, data specific to Puerto Rico was analyzed to identify barriers to timely cervical cancer screening and treatment. Findings from these sources were combined to inform implementation strategies and expected outcomes.

**Results:** The proposed patient navigation system would educate patients about recommended screening and vaccination guidelines based on age and gender, inform patients of nearby clinics, hospitals, and pharmacies offering appropriate healthcare services, connect patients with providers, and support patients through next steps. The system would also assist high-risk patients by offering appointment reminders, emotional support, and transportation coordination. Evidence from successful U.S. models indicates that patient navigation systems improve early access to screening, increases awareness, and ensures timely interventions.

**Conclusion:** Through education, support, and connection to local resources, a patient navigation system can improve early screening and detection and reduce cervical cancer rates in Puerto Rico.

<sup>1</sup> State Cancer Profiles: Puerto Rico, National Institutes of Health (NIH). <https://statecancerprofiles.cancer.gov/quick-profiles/index.php?statename=puertorico>

<sup>2</sup> Removing Barriers to Care, National Breast and Cervical Cancer Early Detection Program, Centers for Disease Control (CDC). <https://www.cdc.gov/breast-cervical-cancer-screening/success/removing-barriers.html>

# GWSPH RESEARCH SHOWCASE

# HEALTH POLICY AND

# MANAGEMENT

## Understanding the Intersection Between Bike Friendly Communities and Population Health Outcomes

**Background and Significance:** There are strong associations between built environment interventions supporting bike infrastructure and increased levels of physical activity in a community. However, there are noted limitations in the evidence base, especially with regards to longitudinal studies that are more able to attribute causality between built environment interventions and physical activity and better connect built environment to community health outcomes. This study seeks to address these gaps by applying a longitudinal panel analysis to estimate the impact of bike friendly infrastructure and policy on health outcomes.

**Purpose:** How does the adoption of bike friendly policy and infrastructure influence downstream population health outcomes over time?

**Methods:** This study used 2010 to 2021 data from the SMART BRFSS survey which collects data at the Metropolitan Statistical Area (MSA) level, paired with Bike Friendly Community (BFC) status – a certification awarded by the League of American Bicyclists, as a proxy for policy and infrastructure investment in biking. Each MSA's BFC status was coded as a simple yes/no binary variable. SMART BRFSS data for each year were collapsed into MSA averages and appended into a single master dataset. Panel analysis was used to test the strength of a causal relationship between BFC status and population-level health outcomes.

**Findings:** Bike friendly certification status of a locality within a MSA is associated with reduced prevalence of pre-diabetes ( $p < 0.5$ ) in the MSA. The analysis also found evidence for association between BFC status and combined pre-diabetes and diabetes prevalence ( $p < 0.5$ ). The analysis included data from 283 MSAs, representing 1,777 observations in the panel. Of the unique observations (MSA/Year), 565 observations held BFC certification.

**Implications and Future Research:** The policy implications of this finding are far reaching. Investment in bike friendly infrastructure and supporting bikeability of communities may be a valid and effective way to improve community health and wellbeing and prevent downstream health complications caused by cardiometabolic conditions. Future studies should be made with a smaller geographic unit of analysis through methods such as small area estimation to more accurately measure the influence of bike friendly policy. Additionally, while BFC certification status represents a good all-in-one proxy for a combination of policy and environmental factors that support biking, focusing on a single variable, such as percentage of roadways with bike lanes, may help a future analysis better estimate the impact of discrete policy choices.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Capturing Spatial Influence on Community Care Delivery: A Case Study on Community of Hope

Maternal mortality rates in the U.S. have become a critical indicator of societal health, reflecting broader disparities in access to quality care<sup>1</sup>. This case study examines the growing exacerbation of maternal mortality rates, particularly in Washington D.C.'s Wards 5, 7, and 8, where Black women bear a disproportionate burden<sup>2</sup>. Despite the city's sixteen hospitals, these wards—home to a third of D.C.'s population—lack obstetric units. In response, The Community of Hope merged with Family Health and Birthing Center to create the only midwife-run birthing center in D.C., providing maternal health services.

A lot of time is spent indoors, particularly in work and healing spaces, which can influence the experiences of both providers and patients. While these spaces historically work against health equity, this study explores the intersectionality of race, socioeconomic factors, and healthcare access contributing to these disparities, and the efforts of COH to overcome them. CDC defines the built environment as the physical parts where we live and work<sup>3</sup>. Given the development of the new Community of Hope Family Health and Birthing Center, this research explores the impact of this built environment on care delivery and asks:

1. *How does the built environment at Community of Hope Family Health and Birthing Center fulfill the needs of the community?*
2. *How does the environment at Community of Hope influence the relationship between providers and community members seeking services?*

This research draws upon qualitative research using a case study analysis of COH's innovative approach to dismantling clinical barriers. The staff selected through purposive sampling included: a practicing Midwife, Clinical Lead, and an administrative representative. The interviews were recorded, transcribed, and coded using thematic analysis.

Through thematic analysis, this study explores how the built environment impacts care delivery, emphasizing the roles of both providers and administration. It highlights unique approaches, tone, and patient populations, revealing how the physical setting at COH directly shapes these dynamics. The interconnected themes provide insights into the patient-provider relationship, answering how the built environment influences the quality of interactions between patients and providers. The study emphasizes the need for sustained investment in community-based healthcare infrastructure and integrative health models to improve access, outcomes, and equity in underserved populations. It highlights the impact of patient-centered spaces like COH in strengthening patient-provider relationships and addressing health disparities. By prioritizing health equity and amplifying community voices, these investments can create culturally responsive care environments that build trust, promote continuity of care, and support ongoing research to assess and refine their efficacy.

<sup>1</sup>Sajedinejad, S., Majdzadeh, R., Vedadhir, A., Tabatabaei, M. G., & Mohammad, K., "Maternal mortality: a cross-sectional study in global health," *Globalization and Health*, Vol. 11, No. 4. (Feb. 12, 2015).

<sup>2</sup>Grablick, C. (2020). Black people accounted for 90% of pregnancy-related deaths in D.C., study finds. *DCList*, Retrieved from <https://dcist.com/story/22/04/28/dc-maternal-mortality-study-2022/>

<sup>3</sup>Centers for Disease Control and Prevention. (n.d.). *Built environment assessment*. Centers for Disease Control and Prevention. Retrieved March 28, 2025, from <https://www.cdc.gov/physical-activity/php/built-environment-assessment/index.html>

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## The Impact of Exam Stress on College Students' Eating Behaviors and Food Choices

**Background:** College students face numerous stressors, with exams being one of the most significant ones. The transition to college, new responsibilities, and the intense academic demands contribute to elevated stress levels in college students, impacting various aspects of their lives, like eating behaviors and dietary patterns. Specifically, during exam periods, stress often influences students' food choices, pushing them toward more convenient, energy-dense foods or irregular eating habits. Understanding the factors that drive these changes is important since stress-induced eating behaviors can have lasting implications for physical and mental health, weight management, and overall academic performance. Students are also likely to carry these eating habits in their life after university, which can lead to increased risk of obesity, chronic diseases like diabetes and heart disease, respiratory issues, etc. Malnutrition during college can lead to an overall decrease in energy levels, potentially setting the stage for long-term health problems throughout life.

**Methods:** This is a quantitative, cross-sectional design. The sample size is 42 undergraduate students. Sampling and recruitment were done through an online survey distributed via email, social media, and university platforms to reach as many participants as possible.

**Results:** Convenience and lack of time are the primary drivers of these changes, as students prioritize quick and easy options to cope with increased stress and demanding schedules. While the direct correlation between stress levels and specific food choices may be low, the overall shift toward calorie-dense, sugary, and caffeinated options demonstrates the need for greater awareness and support for healthier eating habits during stressful periods

**Conclusion:** Encouraging time management strategies, offering healthier convenient food options, and promoting stress-reduction techniques could help students maintain better nutritional habits, even during exam seasons, and they can eventually take

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## The American Dream Facing Barriers of Accessing Healthcare for Refugee Children and Youths: Systematic Review

**Background:** United States (US) have been and always will be a place for dreamers. Today, the inviting tune by politicians changed and some attitude became unwelcoming for newcomers. Regardless of politics, children and young individuals have the right to access healthcare. This access, despite its necessity, comes with many challenges and barriers.

**Objective:** To summarize the rich literature studying barriers and challenges of refugee children and asylum seeker to access all forms of healthcare in US.

**Methodology:** This study was set to summarize the English published literature from 1980-2024. Multiple databases were explored to find published articles using 24 keywords. The databases included PubMed, Medline, Cochrane Review, EBSCO, Scopus, and Google Scholars. To screen articles through titles screen followed by abstracts and full articles screen, a team of paired investigators were assigned by principal investigator (PI). In case a conflict, the PI was able to resolve it and make a final decision.

**Results:** The initial search through multiple platforms yielded 1225 articles. Duplicates mounted to 124 articles and were removed. The remaining 1101 articles went through title screen and left 277 articles for abstract screening. The next stage of screening abstracts filtered studies down to 109 articles. Next, a full article screen allowed 40 studies to be included in the final systematic review. The majority of studies focused on individual barriers faced by families and children while ignoring systematic issues. Language barrier was recognized as the most prominent barrier followed by transportation and difficulty in understanding how to navigate US healthcare system. Distrust, perceived discrimination and lack of insurance were other reported barriers for refugee children and youths. However, refugee children are not a homogenous group and their needs differ. Additionally, US is a very diverse nation and states' legislations supportive of refugee children varies. Overall, more vulnerable children and youths like unaccompanied minors, HIV positive youths and children with disabilities face more challenges and barriers especially in unwelcoming states. Furthermore, accessing mental health comes with other major barriers. Stigma and fear of authority figures limit mental healthcare access and disfranchise refugee children further. Eventually, majority of studies adopted qualitative methodology and had moderate risk of bias.

**Conclusion:** Refugee children and youths face many challenges and barriers in accessing healthcare in the US. The current literature focused on individual barriers and future research should address systematic issues, racism and xenophobia. The identified barriers double in unwelcoming states and for more vulnerable children. There is a need for quantitative data to measure barriers in accessing healthcare precisely to plan a better and more inclusive future for all.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Be Smart And Use Smartphones for Telemedicine: Narrative Review

**Background:** With the evolution of technology, the delivery modes of healthcare have been completely transformed. Healthcare systems worldwide are saturated in patient volume, leaving hospitals at capacity with a scarcity of resources. Since the first use of telemedicine in the late 20th century, further expansion has displayed smartphones as a potential mode of delivery. Using a singular device to offer a wide range of services is both desired and necessary to provide higher-quality care at greater quantities. The inclusion of this form of telemedicine in many high-income countries proves a plausible framework to build upon for inclusion in low-and middle-income countries (LMIC).

**Objectives:** The primary goal of this review was to analyze existing literature on smartphone-based telemedicine and assess the scalability of this form of care to provide both accessible and equal care to all people.

**Methodology:** This is a narrative review that analyzed English published literature in PubMed, Medline, Cochrane Reviews, and Google Scholar over the last 50 years.

**Main findings:** Smartphone-based telemedicine can be divided mainly to mHealth and teleconsultation. Both applications are proven cost-effective at different extents and can augment health in different capacities. While mHealth is more suitable for health behavior change, smartphone teleconsultations can be employed in direct patient care. Smartphones' applicability to different settings and flexibility expands their utility for telemedicine. This form of telemedicine might be more suitable for low-resource settings and LMIC due to compatibility with current infrastructure, ease of use, lower cost and high availability. However, ease of use comes with risk of overutilization and providers' burnout.

Concern about privacy, digital divide and health literacy are other barriers of accessing smartphone-based telemedicine. Growing smartphone penetration and technology advancement carry future potentials for scaling up smartphone telemedicine in LMIC to advance equity and equality. Still, policies and regulations need to be implemented to protect privacy while using smartphones for telemedicine.

**Conclusion:** Smartphone-based telemedicine is expanding and is an applicable form of telemedicine for low-resource settings and LMIC. Not all mHealth applications are suitable for LMIC, but investing in smartphone-based telemedicine for teleconsultation can save lives and lower the cost of care to reach everyone efficiently without a huge burden in a cost-effective manner for many LMIC.

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# GWSPH RESEARCH SHOWCASE

## PREVENTION AND COMMUNITY HEALTH

### Exploring the Relationship Between Perceived Discrimination, Gender-based Violence on College Campuses, and Mental Health Outcomes among Female South Asian College Students in the United States

**Background:** Designing health interventions for South Asian female college students presents unique challenges due to variations in ethnicity, socioeconomic statuses, and healthcare practices within this population. While extensive research exists on the impact of interpersonal violence and perceived discrimination on mental health outcomes among South Asian women, as well as the prevalence of gender-based violence on college campuses, little is known about how these factors intersect specifically for South Asian female college students in the United States. This study applies the “Model Minority” myth and the Minority Stress Model, to examine the dual impact of perceived discrimination and campus-based gender-based violence on mental health outcomes in this population.

**Research Purpose:** This study aims to assess how perceived discrimination and campus violence independently and collectively contribute to depression and anxiety among South Asian female college students in the United States. Additionally, it examines how perceived discrimination influences help-seeking behaviors among those who have experienced campus violence, particularly in accessing campus healthcare services.

**Methods:** A cross-sectional, anonymous, quantitative survey was conducted among South Asian female college students in the United States. Initial recruitment targeted South Asian student organizations at ten universities via email and social media, followed by snowball sampling to extend the participant pool across additional institutions.

**Findings and Conclusion:** Early findings indicate that perceived discrimination and gender-based violence on campus are associated with heightened levels of anxiety and depression. These factors also appear to act as barriers to healthcare-seeking behaviors among South Asian female college students.

#### Implications of Findings:

South Asian female college students are an understudied population in public health, leading to gaps in understanding their mental health outcomes and health-seeking behaviors. This study provides critical insights into how college experiences—such as discrimination, violence, and overall campus climate—shape mental health outcomes in this group. Findings from this research will inform targeted public health interventions aimed at improving mental health support and access to healthcare services for South Asian female college students, ultimately promoting their overall well-being.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Policy Proposals for Treating and Rehabilitating Individuals with Substance Use Disorder in the United States' Criminal Justice System: A Comprehensive Primary Literature Analysis

**Problem Leading to Research Question:** Research shows that substance use disorder (SUD)/addiction can lead to impaired judgment and long-term executive function problems. Persons with SUD may find themselves involved with the criminal justice system as a result of engaging in illegal activities either to get drugs or as a result of impaired judgment from drug use. Incarceration is neither an effective deterrent nor treatment for SUD, and data show that persons with SUD are at greater risk of re-arrest/re-incarceration. Research indicates that SUD rehabilitation programs overseen or directed by courts/corrections can be successful, particularly in reducing recidivism into the criminal justice system. This project is a systematic review of the available, peer-reviewed literature to: (1) determine the most effective practices for successfully linking and retaining justice-involved persons with SUD with effective rehabilitative programs and (2) determine (via cost-benefit analyses) if increasing investment in such programs is justifiable from the dual perspectives of public financing and public health.

**Methods:** The literature search was conducted using 9 different academic databases and the general search terms "substance abuse," "treatment," and "recidivism," with the latter term being defined as new charges or re-arrest. Studies included in the final review needed to focus on previously or formerly incarcerated individuals receiving some type of court-directed SUD treatment, with measurable outcomes pertaining to crime recidivism. Covidence and full-text review were used to determine if articles were appropriate for inclusion.

**Early Findings:** The search yielded 382 total articles, which, after applying the screening criteria, included 86 articles for the final review. 15 articles explicitly focused on treatment for opioid/heroin use, 8 focused on treatment for alcohol use, 2 focused on treatment for cocaine and other illicit stimulant use, and 61 focused on comprehensive SUD treatment. Most of the imposed treatments were found to have a range of statistical significance in terms of effectiveness, and some treatments showed no statistical significance in reducing recidivism. A thorough comparison of treatments, classified by DOC (Drug of Choice) being treated, is discussed.

**Significance and Discussion:** The findings of this systematic review have the potential to inform the implementation of policies relevant to the provision of court-appointed or corrections-provided SUD treatment and recovery programming for justice-involved persons struggling with addiction. Further research is needed to assess the longer-term effectiveness and cost-effectiveness of such programs and address the areas where gaps in available data are insufficient to support evidence-based policy recommendations.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Early Beginnings: A Program Evaluation of the Prince George's County Infants and Toddlers Program for Next Steps in Transition at Age 3

**Background:** The Individuals with Disabilities Education Act (IDEA) provides special education and related services to children with disabilities and/or developmental delays (DD). Approximately 7.5 million children reported having disabilities and receiving Early Intervention (EI) or special education services during the 2022-2023 school year. The Individualized Family Service Plan (IFSP) is used for eligible families and early interventionists under IDEA and measures three domains of functional development: Developing Positive Social Emotional Skills and Relationships, Acquiring and Using Knowledge and Skills, and Using Appropriate Behaviors to Meet Needs and measured using the Child Outcome Summary (COS) ratings ranging from 1 to 7 with a higher score indicating positive developmental trends. All children must transition out of the program at age 3.

**Purpose of research:** Research Question: Among students who exited the program at age 3 due to transition during the 2021-22 school year, what factors influence progress in the child outcome summary?

**Specific Aim:** Conduct a case-based analysis to examine and identify the underlying factors associated with children reaching their developmental milestones prior to transitioning at age 3 among participating eligible families in the Prince George's County Infants and Toddlers Program (PGITP) during the 2021-22 school year.

**Methods:** Data was obtained from the Birth-Kindergarten Maryland Online Individualized Family Service Plan (MDOL) system and analyzed using the IBM® SPSS® software. The final study population included children who transitioned and had entry and exit COS scores. Sample characteristics such as age at referral, zip code, Medicaid (MA) status, foster care status, race, family's primary language, family interpreter need, child's primary language, family choice, and transition results were included in the analyses. Paired-sample t-test was conducted to determine an association between entry COS and exit COS scores for students who transitioned at age 3.

**Preliminary Findings and Conclusions:** There were 724 children who had both pre and post assessments, and 347 who transitioned and met study selection criteria. Increase the number of children exiting with COS score ratings of 5+ among those ages 33-36 months enrolled in the PGITP before their third birthday. Results of Paired-sample t-tests demonstrated significant associations between entry and exit COS scores ( $p < 0.001$ ). Regression analyses indicated significant associations with selected familial and child characteristics.

**Implications of Findings:** The findings indicate significant increase in school readiness among students with DD who participate in the PGITP that are preparing to transition at age 3. a disparity exists in student achievement and school readiness amongst students with disabilities and/or DD.

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# GWSPH RESEARCH SHOWCASE

## PREVENTION AND COMMUNITY HEALTH

### Profiles of quality of life and associations with hope and psychological flexibility among young adult cancer survivors in the US

**Background:** Given the growing population of young adult (YA) cancer survivors, it is crucial to understand their different quality of life (QOL) profiles to inform interventions to promote QOL, which may target constructs like hope or psychological flexibility.

**Purpose:** This study assessed: 1) latent classes of YA cancer survivors based on PROMIS QOL dimensions (physical function, fatigue, sleep disturbance, pain interference, social function, anxiety, depression); 2) sociodemographic and cancer-related factors associated with QOL classes; and 3) QOL classes in relation to hope and psychological flexibility, controlling for sociodemographic and cancer-related factors.

**Methods:** Latent class analysis (LCA) was conducted on PROMIS QOL measures (physical functioning, fatigue, sleep disturbance, pain interference, social functioning, anxiety, depression) among 155 YA survivors (ages 18-39;  $M_{age}=32.89$ , 87.7% female, 8.4% Hispanic, 22.6% racial minority) within 3 years post-treatment. Then, we conducted multivariable analyses assessing sociodemographic and cancer-related factors in relation to class membership (multinomial logistic regression), and class membership in relation to hope and psychological inflexibility (linear regressions, controlling for covariates).

**Findings:** LCA identified 4 classes: (1) low physical/social functioning with high symptoms (i.e., fatigue, sleep disturbance, pain interference, anxiety, depression; 43.2%); (2) high physical/social functioning with high symptoms (23.9%); (3) high physical/social functioning with low symptoms (17.4%); and (4) low physical functioning, moderate social functioning and physical symptoms, and low mental health symptoms (15.5%). In multivariable regression, compared to class 3 (referent), classes 1 and 4 more likely had chemotherapy (aOR=6.54, CI=1.22, 34.48; aOR=12.82, CI=1.05, 28.67), and class 2 had higher monthly income ( $\geq$  vs.  $<$ \$4,200: aOR=1.16, CI=1.02, 1.54). Additionally, classes 1 and 2 had lower hope ( $B=-10.95$ , CI=-14.42, -7.48 and  $B=-5.50$ , CI=-9.28, -1.71) and higher psychological inflexibility ( $B=12.41$ , CI=9.06, 15.76 and  $B=8.21$ , CI=4.57, 11.86).

**Implications:** YA cancer survivors demonstrated varied QOL profiles, often with significant symptoms. Interventions targeting hope and/or psychological flexibility may promote QOL.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Disaggregating Diversity: Identifying Sources of South Asian American Health Data

**Background:** South Asian Americans (SAA) are one of the fastest growing populations in the United States, and comprise different cultural identities, backgrounds, and histories. However, there is a notable lack of concurrent data collection on the health needs and experiences of this community. Many sources do not disaggregate data by SAA subgroups (i.e., Asian Indians, Pakistanis, Bangladeshis), inhibiting the ability to understand nuances in health outcomes and disparities within and across SAA sub-communities.

**Purpose:** The study aims to identify existing sources of SAA health data to understand the prevalence of data sources that disaggregate health information by different SAA subgroups.

**Methods:** A scoping review of 21 sources was conducted to identify 15 data sources, surveys, and needs assessments that report health data on SAA communities with varying degrees of disaggregation. Findings were synthesized into a data table compiling a list of disaggregated health outcomes datasets.

**Findings:** Datasets that disaggregate SAA health outcomes are limited. However, the American Community Survey, the California Department of Health's API Data Disaggregation Brief, and the Decennial Census were data sources that reported current disaggregated health data for all SAA subgroups. Health insurance status, education patterns, poverty status, and citizenship status were key health determinants these organizations reported data on for all SAA ethnic identities. While other organizations presented health outcomes data that was similarly extensive, they neglected to study disparities across SAA subgroups, often grouping all 'South Asians' together or only reporting on Asian Indians.

**Implications:** Without disaggregated data, unique health risks in the SAA community go unnoticed. Further research is critical to continue studying this growing population. By breaking down SAA data by ethnicity, researchers and policymakers can better identify health inequities, develop targeted interventions, and ensure all SAA communities receive necessary care and resources.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Associations Between Demonstrated and Self-Reported Condom Use Knowledge and Self-Efficacy in Gay and Bisexual Adolescents

**Background:** Adolescent men who have sex with men (AMSM) make up a majority of new HIV infections among teens, and research finds that 44% of AMSM engage in condomless sex. Strengthening correct condom use knowledge and skills in AMSM is an important goal for intervention. Measuring intervention effects on those skills requires appropriate tools. Prior research has utilized primarily self-report survey measures for assessing skills in this population, which come with multiple limitations.

**Purpose:** The current study aims to 1) use a novel, objective assessment of condom skills to directly observe condom use skills in AMSM; 2) determine how the tool correlates with self-reported survey measures of condom use self-efficacy and knowledge of correct condom techniques; and 3) assess the value of the tool in capturing variability in demonstrated condom use skills as opposed to self-reported measures only.

**Methods:** Data come from the control arm of an HIV prevention intervention trial with AMSM. Self-reported 3-month survey responses from 52 AMSM participants assessed perceived condom use self-efficacy and condom knowledge. Participants were on average 16-years old, 36.5% gay-identified, and 30.8% racial/ethnic minority. The objective condom skills assessment (CSA) was administered after the 3-month survey and asked AMSM participants to verbally and physically explain how to use a condom with a penile model. Participant behaviors and responses during the CSAs were coded by study team members to determine the number of errors participants made in various phases of condom application (i.e., opening the condom, applying the condom, removing the condom, and selecting correct lubricants).

**Findings:** The most frequent condom use errors included not checking the expiration date (94.2%), not checking if the condom is the right material (98.1%), or not indicating a correct understanding of the direction to unroll it (75%). On average, participants correctly identified 75% of lubricants. Statistically significant correlations were observed between self-reported knowledge and self-efficacy and demonstrated condom application errors ( $r = -.390$  and  $-.307$ ,  $p < 0.05$ ). Notably, despite these correlations, errors were observed even among participants who scored well on self-report measures of condom knowledge.

**Implications:** Findings indicated the value of using an objective assessment tool to understand the extent of condom use knowledge skills and self-efficacy in AMSM, as opposed to only administering survey measures. Future research should consider the benefits of direct observations as a complement to self-reports in better measuring how well AMSM use condoms.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

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## Associations between cannabis use and food insecurity risk among US adults with and without children

**Background:** Cannabis use and food insecurity (FI) have increased in prevalence in the United States, yet how cannabis use and FI relate and interact, particularly among young parents, remains understudied. We assessed associations between cannabis use and FI among young adults and differences based on parental status.

**Methods:** We analyzed two waves (W1-W2) of survey data from 2023-2024 among 3437 US young adults (ages 18-34;  $M_{age}=26.4$ , 61.6% female, 30.4% parents, 27.5% sexual minority, 12.5% Black; ~50% using cannabis by design). Logistic regressions examined W1 past-month cannabis use and W2 past-year FI, and W2 FI and W2 past-month cannabis use, cannabis expenditures, and impact of cannabis cost on amount used, separately, adjusting for sociodemographics and state non-medical cannabis laws. We assessed the moderating effect of parental status on each of the above associations.

**Results:** At W1, 46.6% of participants reported cannabis use. At W2, 39.5% reported cannabis use, 48.2% FI, and 22.9% cannabis use and FI. W1 cannabis use was associated with greater odds of W2 FI (adjusted odds ratio [aOR]=1.62, 95%CI=1.39, 1.88). W2 FI was associated with greater odds of W2 cannabis use (aOR=1.44, 95%CI=1.24, 1.68), greater cannabis expenditures (aOR=1.44, 95%CI=1.17, 1.78), and greater impact of cost on use (aOR=1.92, 95%CI=1.57, 2.35). Associations between W2 FI and W2 cannabis use were stronger among parents versus adults without children.

**Conclusion:** Interventions to support young adults, especially parents, in making informed decisions about resource allocation, reducing cannabis use, and mitigating FI are needed. Such interventions may be critical in reducing related disparities.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## The Role of Female Physicians in Pakistan's Maternal and Child Health Workforce: Barriers to Entry and Retention - A Qualitative Study

**Background and Significance:** Female physicians are essential to addressing Pakistan's maternal and child health (MCH) crisis, where maternal mortality rates remain alarmingly high at 154 deaths per 100,000 live births. Although women comprise 70% of medical school graduates in the country, a significant number do not practice due to cultural and societal barriers. Tackling these barriers is vital for improving health outcomes, particularly for women in underserved areas who may prefer female healthcare providers. This study examines the barriers and facilitators that female physicians in Pakistan encounter within the MCH workforce. The goal is to understand how cultural norms, societal expectations, and workplace environments influence women's ability to enter and remain in this workforce.

**Methods:** A qualitative research study involving semi-structured interviews with 8 female physicians working in Pakistan's MCH workforce was conducted. The data was thematically analyzed to identify recurring patterns related to gender roles, workplace challenges, safety concerns, and other topics that arise.

**Results:** Although data collection is in progress, early discussions have found that traditional gender roles, a lack of social support, and safety concerns hinder women's participation in the MCH workforce as physicians. Furthermore, family responsibilities and societal pressures compel women to leave the workforce.

**Conclusion:** By identifying these barriers, this study hopes to inform policies and programs aimed at increasing female physician retention in Pakistan's MCH workforce.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## The effect of antisemitic messaging on GW's campus on Jewish students' mental health.

**Background:** The rise of antisemitism has been prominent amid the ongoing Israel-Hamas war since October 7, 2023. At George Washington University (GW), Jewish students have encountered hostile imagery and rhetoric on campus, leading to increased feelings of fear and exclusion.

**Purpose:** This project aimed to assess experiences of antisemitism among Jewish students, measure associated stress levels and identify their correlation. A secondary aim was to provide recommendations to GW administration for improving campus inclusivity.

**Methods:** A convenience sample of Jewish students at GW was surveyed to assess attitudes, perceptions, and the impact of antisemitism on their well-being. A pilot study of 19 Jewish students was conducted via an online survey distributed through QR codes at the Hillel building. Responses were analyzed using SPSS and Excel to calculate experiences of antisemitism and stress.

**Results:** Preliminary findings indicate that students perceive antisemitism related to criticism of Israel as more prevalent than antisemitism tied to anti-Jewish stereotypes. A majority identified the political left as causing more concern. Students reported antisemitism affecting their daily campus lives and primarily sought support through Jewish community spaces rather than university mental health resources. Some students were hesitant to participate in the survey due to concerns about discussing antisemitism.

**Conclusion:** Jewish students at GW experience significant antisemitism, impacting their emotional well-being. While this study focused on GW, antisemitism is prevalent in American universities, making its prevention a national public health priority. University administrations must implement policies that protect Jewish students, increase awareness, and enhance support systems to foster a safer campus environment.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Indicators of intergenerational transmission of cannabis use among US young adults

**Background & Significance of the Study.** Two influential factors in young adults' cannabis use include having cannabis-using parents and becoming parents themselves. Furthermore, these factors may differentially impact certain subgroups who are more likely to use cannabis (e.g., males, those with mental health conditions, or those living in states with legal non-medical cannabis). Understanding correlates of intergenerational cannabis use is critical for addressing cannabis-related disparities, especially within the changing cannabis regulatory context.

**Purposes.** This study examined: 1) young adults' reports of having cannabis-using parents in relation to young adults' lifetime cannabis use and age of first use; 2) young adults' reports of having cannabis-using parents and having children of their own in relation to current cannabis use behaviors (i.e., past-month cannabis use, past-year quit attempts among those reporting past-month use); and 3) potential moderating effects of these factors on the associations between other use-related correlates (i.e., sociodemographics, psychosocial factors, state non-medical cannabis legalization) and cannabis use.

**Methods.** We analyzed 2023 survey data among 4,031 US young adults (Mean=26.29; 48.8% past-month cannabis use by design). Multivariable logistic regression examined participants' reports of having cannabis-using parents and having children themselves in relation to past-month cannabis use, and the moderating effects of having cannabis-using parents and having children on associations of sociodemographics (age, sex, race/ethnicity, education, relationship status), psychosocial factors (depression, anxiety disorder, and ADHD diagnoses; adverse childhood events [ACEs]), and state non-medical cannabis legalization with cannabis use.

**Results & Conclusions.** Having cannabis-using parents (aOR=2.90, 95%CI=2.42, 3.47) and having children (aOR=1.37, 95%CI=1.12, 1.67) were associated with cannabis use. However, having children was associated with use only among those without cannabis-using parents (but not those with). Additionally, for those without cannabis-using parents, living in states with legal non-medical cannabis, and more ACEs were associated with greater odds of cannabis use. For participants with children (but not those without), having less than a bachelor's degree was associated with greater use. For both participants with and without children, being male was significantly associated with greater odds of cannabis use, but the magnitude of the effect was greater for those with children. Other correlates of use included being older, sexual minority, Hispanic, Black, unmarried, and diagnosed with depression or ADHD.

**Implications.** Given intergenerational influences on cannabis use and related disparities, interventions targeting parental use and related communication with children are needed to address cannabis use disparities and intergenerational use transfer.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Profiles of cannabis use and expense-related factors among US young adults

**Background & Significance of the Study.** Given the changing cannabis policy and retail environment, this study examined profiles of young adults with differing cannabis consumer characteristics (e.g., products used, impact of cost), which main inform efforts to address potentially related disparities.

**Purposes.** This study aimed to advance the literature by examining: 1) profiles of young adults characterized by a combination of cannabis price and use related factors; and 2) state non-medical cannabis legislative context and sociodemographic factors in relation to these profiles.

**Methods.** Using 2024 survey data among 1,359 US young adults reporting past-month cannabis use (Mage=26.95, 61.4% female, 34.5% sexual minority, 20.7% Hispanic, 17.9% Black, 7.7% Asian), latent class analysis (LCA) were conducted based on these indicators: perceived cost of the cheapest product (\$1-10; >\$10), impact of cost on use (low; moderate; high), monthly cannabis expenditures (\$0-25, \$26-100, >\$100), and days (1-5; 6-20; ≥21) and type used (herb/flower; edibles; oils/vape; concentrates/other). Multinomial logistic regressions assessed sociodemographic factors and state non-medical cannabis legislative context in relation to class membership.

**Results & Conclusions.** LCA identified 4 classes: 1) 'Price-insensitive, low-spend, low-level bud/edible use' (36.1%); 2) 'Semi-price-sensitive, high-spend, high-level bud/oil/concentrate use' (31.9%); 3) 'Semi-price-sensitive, moderate-spend, mid-level oil/other product use' (24.1%); and 4) 'Price-sensitive, high-spend, mid-level mixed product use' (7.9%). Compared to Class 1 (referent), Class 2 were older (aOR=1.05, 95%CI=1.02-1.09) with higher odds of <bachelor's degree education (aOR=3.24, 95%CI=2.30-4.59), cohabitating (vs. single/other; aOR=1.64, 95%CI=1.15-2.30), and having children (aOR=1.43, 95%CI=1.01-2.04), but lower odds of being Asian (aOR=0.29, 95%CI=0.14-0.60); Class 3 had higher odds of being Black (vs. White; aOR=1.86, 95%CI=1.24-2.78) and <bachelor's degree educated (vs. ≥bachelor's; aOR=1.57, 95%CI=1.12-2.21), and lower odds of other employment (vs. full-time; aOR=0.62, 95%CI=0.45-0.86); and Class 4 had higher odds of being Black (aOR=3.49, 95%CI=2.05-5.93) and food insecure (vs. secure; aOR=3.34, 95%CI=2.00-5.58). In addition to the cannabis use characteristics, financial factors should be considered when characterizing people using cannabis to understand subpopulation differences, particularly with regard to use-related risks.

**Implications.** The current findings and future studies should inform policies regulating the retail environment and boost targeted educational and intervention efforts to reduce adverse cannabis-related outcomes, particularly among parents and those with less education.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## The Urban Health Program: Serving at Eastern Senior High School

**Background and Purpose:** The purpose of the Urban Health Program (UHP) is to serve a community of people in the DC area by providing knowledge on the social determinants of health and the importance of health. UHP is a critical-service learning organization which allows fellows, like me, to learn from the experiences of serving the community and reflect on ways to better serve them and to improve based on the feedback provided by the community members. For this school year, I have participated in UHP as a fellow on the team that serves Eastern Senior High School.

**Methods:** Students at Eastern Senior High School were recruited to participate in this project through a survey asking students if they were interested in learning about public health and conducting their own research project. The fellows team from George Washington University goes in-person on a bi-weekly basis and gives a presentation to a group of high school students on one of the social determinants of health. In addition to this, high school students have an opportunity to conduct a research study or literature review based on a public health topic that they are interested in. The fellows are present to guide the students in the process of doing research and to provide feedback to the students.

**Preliminary Results:** Most of the students recruited were students who are in the 10<sup>th</sup> grade. From September to December, an average of 5-10 students participated in the program. From January to now, about 3 students have consistently participated in the program, and these students will be presenting their research through a poster session on May 1 at the George Washington University Milken School of Public Health.

**Conclusion:** The students who participated have increased their knowledge and understanding of public health and the social determinants of health, and these students have also learned how to conduct a research project. As a fellow, I have learned the importance of adapting and looking to always improve at each implementation session that the team and I gave at Eastern Senior high school.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Knowledge, Attitudes, and Behaviors Regarding HPV Vaccination and Self-Sampling Among US Young Adults

**Introduction:** Given high HPV and cervical cancer rates and related disparities, this study assessed correlates of HPV-prevention behaviors among US adults.

**Methods:** Using 2022 online survey data from 880 US adults (M age =27.62; 6.0% female, 43.8% sexual minority, 8.7% Hispanic, 73.9% White, 4.5% Black, 11.9% Asian, 9.7% other race), multivariable regression analyses assessed sociodemographics and HPV knowledge in relation to HPV vaccination, willingness to vaccinate one's child, and willingness to engage in HPV self-sampling (among individuals with a cervix).

**Results:** The most common reason for HPV vaccination (58.0%) was doctor recommendation (84.2%), while the main reason for not being vaccinated (42.0%) was lack of doctor recommendation (51.6%). HPV vaccination was associated with being younger (aOR=0.88, CI=0.84, 0.93), female (aOR=2.70, CI=1.92, 3.85), bachelor's (vs. <bachelor's; aOR=1.82, CI=1.16, 2.86) or >bachelor's degree educated (aOR=1.85, CI=1.01, 3.12), not having children (aOR=0.44, CI=0.27, 0.72), and greater HPV knowledge (aOR=1.20, CI=1.10, 1.30). Willingness to vaccinate one's child was associated with identifying as a sexual minority (vs. heterosexual; B=0.16, CI= 0.05, 0.27), Asian race (vs. White; B=0.20, CI=0.04, 0.36), not having children (B=-0.23, CI=-0.38, -0.08), greater HPV knowledge (B=0.06, CI=0.03, 0.08), and HPV vaccination (B=0.39, CI=0.28, 0.50). Among participants with a cervix (n=501), willingness to try HPV self-sampling was associated with identifying as another race (vs. White; B=0.44, CI=0.91, 0.79), not having children (B=-0.30, CI=-0.61, -0.01), greater HPV knowledge (B=0.11, CI=0.05, 0.17), and fewer concerns about self-sampling (B=-0.33, CI=-0.42, -0.24).

**Conclusions:** Interventions involving healthcare providers and parental education are essential for promoting HPV prevention behaviors and reducing disparities.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## A Scoping Review of Patient and Community Engagement in the Development of Assessment Tools

Engaging patients and community members in the development of health professional (HP) and health professions trainee (HPT) assessment tools is critical to designing meaningful and inclusive assessment methods. However, there is a lack of knowledge as to the extent to which patients/communities are engaged in assessment tool development in the health professions. To identify and analyze published examples of patient/community engagement in the development of tools used to assess HPs and HPTs. Using the Arksey and O'Malley model, a scoping review was conducted on HP/HPT assessment tools developed with patient/community input. Inclusion criteria included publication date within 10 years and in English language. Exclusion criteria included articles with surveys on patient experience without assessing the HP/HPT. Each step was performed by a minimum of two researchers: title/abstract review, full-text review, and data extraction. Researchers met to resolve conflicts. To structure the comparison across publications, we utilized the Centers for Disease Control and Prevention's (CDC) Community Engagement Continuum as a framework to rate the level of patient/community engagement in the development of each assessment tool. Data were analyzed using descriptive statistics. Of 2,579 abstracts reviewed, 22 were eligible for data extraction. All assessment tools were questionnaires completed by patients after a clinical experience with a HP or HPT. Tool development methods included focus groups, interviews, discussions, and questionnaires with patients or community members. Most tools (16/22) assessed the HP's communication skills, including listening, showing empathy, and building trust. 15/22 addressed skills with educating patients about diagnoses and management. On the CDC Community Engagement Continuum, articles were rated as involve (7/22), consult (12/22), collaborate (1/22), or shared leadership (1/22); none were rated as outreach. The article rated as shared leadership was distinguished by a patient research advisory group co-creating and making decisions with the research team throughout the entire questionnaire development process. While published examples show patient and community engagement in assessment tool development, such involvement often remains limited to consultative roles. The findings underscore the need for more inclusive and collaborative approaches, moving toward shared leadership, to enhance the relevance and impact of assessment tools in health professions education and practice.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Gender-Transformative and Intersectional Approaches in Community-Based Climate Adaptation Programs in Low and Middle-Income Countries (LMIC): A Scoping Review of Best Practices

**Background:** LMICs are disproportionately burdened with the harmful effects of climate change, severely depleting fragile governments and low-resourced communities. Women, girls, and marginalized populations are disproportionately burdened by the harmful impacts of climate change due to pre-existing structural and gender inequalities; however, climate mitigation and adaptation programs do not consider a gender transformative or intersectional lens. This scoping review will examine existing literature about community-based programs that utilize gender and intersectional lenses in low and middle-income countries (LMICs). This scoping review aims to answer the question: what existing community-based initiatives effectively integrate climate change considerations through an intersectional and gender-responsive lens?

**Methods:** A scoping review was conducted utilizing two rigorous systematic reviews on community-based climate adaptation programs in LMICs incorporating a gender and intersectional lens. These systematic reviews were identified by searches from PubMed, CINAHL, and Scopus. The analysis of the included studies applied an adapted version of the *Intersectional Climate Justice* framework as coined by Amorim-Maia et al. The five components of the framework are: (1) Proactively identifying marginalized populations and giving them decision-making power, (2) Tackling underlying systemic inequalities, (3) Empowering locally based organizations/practitioners from the affected communities, (4) Recognizing Indigenous (community-based) knowledge, (5) Empowering local communities to lead change post-intervention.

**Results:** Effective programs shared key features, including participatory methods, integration of indigenous knowledge, and empowerment of local scholars and community actors. These approaches addressed systemic inequalities, enhanced community engagement, and shaped program goals and outcomes. The findings highlight a significant lack of comprehensive evaluations of existing programs globally, underscoring the need for further research.

**Conclusion:** The results of this scoping review will better inform future climate adaptation and mitigation strategies by integrating gender and intersectionality considerations, specifically in LMICs. The findings of this review can guide the development of more inclusive and equitable climate policies that address the specific needs of those most affected by the harmful impacts of climate change: women, girls, and marginalized populations in LMICs.

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# GWSPH RESEARCH SHOWCASE

## PREVENTION AND COMMUNITY HEALTH

### **Quickies with Benefits: Investigating the Role of a Sex-Ed Short-Form Video Series, *Quickies*, on GW Students' Sexual Health Knowledge**

This study evaluates the impact of the *Quickies* sexual health education campaign at George Washington University, focusing on student demographics, prior sex education experiences, knowledge retention, and engagement with campaign. The research aims to assess the gaps in sexual health knowledge and effectiveness of digital educational initiatives, like *Quickies*. Using SPSS, this study analyzed data collected by the Office of Health Promotion and Education at GW to improve their sexual health programming. A cross-sectional, two-independent sample study design was used to examine student demographics, sexual education background, and perceptions. Crosstabulations were conducted to explore the relationship between students' responses to knowledge check questions, campaign exposure, and level of sexual health education provided in their high school state. Findings indicate significant gaps in students' prior sexual health education, particularly among those from states with limited or contraception education coverage. Most students expressed a strong preference for comprehensive sexual health education, prioritizing topics such as consent, prevention (i.e. HIV, pregnancy, STIs), and contraceptives. The campaign reached over 14,000 Instagram accounts and accumulated more than 24,000 views. While some improvements were observed in knowledge, misconceptions remained regarding PrEP, PEP, and STI testing. Data suggest a potential correlation between following @wellbeingatgw on Instagram and increasing sexual health knowledge, though causation cannot be determined. The findings highlight the importance of university-level sexual health education initiatives and digital outreach strategies in addressing knowledge gaps. While social media campaigns can effectively engage students, misconceptions persist in key areas, indicating the need for continued and targeted education efforts. Future research should explore long-term knowledge retention, enhanced recruitment strategies, and additional methods for measuring campaign effectiveness.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Understanding FGM/C Survivors' Experiences: Implications for Physician Assistant Education and Training

**Background:** Female genital mutilation/ cutting (FGM/C) is a significant global health and human rights issue, yet healthcare providers, including physician assistants (PAs), receive limited training on how to support survivors. This qualitative study examines the experiences of FGM/C survivors to inform PA education and improve culturally sensitive and trauma-informed care.

**Methods:** A qualitative study was conducted using in-depth interviews with FGM/C survivors (n=24). Data was analyzed using thematic analysis in Dedoose with coding focused on cultural perceptions, FGM/C experiences, medical complications, sexual health, and healthcare encounters.

**Results:** There were three major cultural themes that were common to how the survivors described their FGM/C experience. They include FGM/C being used to curb sexuality; FGM/C being touted as a religious obligation; and an emphasis on secrecy surrounding the practice (many survivors were told not to discuss their experience). Survivors commonly described parental involvement in their FGM/C experience, with some even being cut by family members. Most survivors were cut by either a dedicated cutter or a medical professional compared to few being cut directly by family members. Additionally, most survivors included in the interviews underwent Type 3 FGM/C, with cutting of some or all of the external genitalia and sewing of the vaginal opening. The most frequent medical complications centered on pregnancy and birth, urinary health, and menstrual difficulties. Sexual health concerns of survivors centered on pain during sex, reduced pleasure, and decreased libido difficulties. Healthcare experiences varied, with more survivors of FGM/C reporting a negative experience with providers compared to positive ones. All participants emphasized the need for improved provider training and many offered recommendations for how providers can support survivors.

**Conclusion:** These findings highlight the urgent need for PA education on FGM/C, with a focus on cultural sensitivity, medical management, and trauma-informed care. Integrating survivor-informed training into PA curricula can improve provider competency and patient outcomes. Further research should explore survivor-led initiatives for provider education.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Exploring the Relationship Between Burnout Levels Among Rural vs. Urban MCH Professionals in the U.S.: A Cross-Sectional Quantitative and Qualitative Study

**Background:** Maternal mortality remains a significant concern in the United States, with rates significantly higher compared to other developed countries. The COVID-19 pandemic exacerbated this issue, with maternal mortality peaking at 32.9 deaths per 100,000 live births. Persistent disparities are evident, with Black women experiencing the highest rate of 50.3 deaths per 100,000 live births in 2023. While proper diagnosis, treatment, and patient care are essential for addressing these disparities, healthcare providers face escalating levels of burnout, potentially compromising care quality.

**Methods:** This study aims to assess burnout among Maternal and Child Health (MCH) professionals using a mixed-methods approach. A quantitative, web-based anonymous survey was conducted across the United States, supplemented by individual qualitative interviews with midwives in North Carolina, Maryland, and Virginia. The quantitative survey employs the Maslach Burnout Inventory-Human Services Survey (MBI-HSS) to measure burnout across three dimensions: emotional exhaustion, depersonalization, and personal accomplishment. Additionally, the Oxford Happiness Questionnaire (OHQ) - Short Form was included to evaluate subjective well-being. The study investigates differences in burnout between MCH professionals in urban and rural settings.

**Results:** Preliminary qualitative results suggest that midwives face burnout stemming from inadequate workplace and community support, irregular sleep patterns, demanding on-call schedules, a limited workforce in their area, and extensive travel between patients. Quantitative results will present mean MBI-HSS scores across the three dimensions, along with OHQ means, highlighting rural versus urban comparisons.

**Conclusion:** These findings will reveal the impact of the work environment on healthcare professional burnout, focusing on on-call schedules, sleep deprivation, commute time, and lack of workplace support. The study's results may inform targeted interventions to mitigate burnout among MCH professionals, potentially improving the quality of maternal care and outcomes.

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# GWSPH RESEARCH SHOWCASE

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# COMMUNITY HEALTH

## Reforming CKD Care: From Bias to Balancing Options through Culturally Sensitive and Trauma-Informed Education

Chronic kidney disease (CKD) care often exhibits bias toward specific treatment modalities, particularly hemodialysis, limiting patient awareness, fully informed consent, and access to all kidney failure care options. Additionally, healthcare professionals frequently lack confidence in discussing the full range of treatments, and existing educational materials commonly lack cultural sensitivity. To address these biases, the PCORI-funded ExPAND project integrated cultural tailoring into educational resources, including patient decision aids and provider training, to promote a more equitable approach to CKD decision-making.

The initiative engaged four focus groups (N=19) composed of culturally diverse participants and a national patient advisory group to co-design patient decision aids that incorporate trauma-informed care principles and ensure accessibility. The project assessed the health literacy of patients co-created decision aids and revised materials to achieve a Flesch-Kincaid fifth-grade readability level. Key components of the intervention included:

- **An updated KDE slide deck** incorporating diverse imagery and unbiased presentation of all kidney failure treatment options.
- **A culturally sensitive patient decision aid video** on Active Medical Care Without Dialysis (AMCWD).
- **A FAQ-format handout** to accompany the video and support patient decision-making.
- **Three training sessions for nephrology clinicians** (nephrologists, APRNs, RNs, PAs, and social workers) on shared decision-making, the Ask-Tell-Ask communication approach, empathetic listening, and trauma-informed care.

Clinician training evaluations demonstrated significant improvements in shared decision-making knowledge (1.92, 95% CI 1.29-2.55,  $p < 0.0001$ ,  $n = 25$ ), trauma-informed care (0.92, 95% CI 0.46-1.38,  $p = 0.0004$ ,  $n = 25$ ), and empathetic communication techniques (0.79, 95% CI 0.38-1.20,  $p = 0.0008$ ,  $n = 19$ ).

This work highlights the importance of cultural tailoring in nephrology education to reduce bias in CKD care and ensure that patients receive comprehensive, patient-centered education aligned with their values. Enhancing healthcare professionals' knowledge in shared decision-making and trauma-informed communication equips the public health workforce to deliver more inclusive, unbiased CKD education, ultimately fostering health equity in kidney disease management.

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# GWSPH RESEARCH SHOWCASE

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## The Role of Familial Expectations on College Proximity Choices and Mental Health Outcomes Among Female South Asian College Students in the United States.

**Background & Significance of the Study:** South Asian college students in the U.S. navigate unique stressors shaped by collective achievement, cultural value, and familial expectations that emphasize respect for authority and family reputation. Despite high college enrollment rates among South Asians, limited research explores how these expectations influence college proximity decisions and mental health. This study focuses specifically on South Asian female college students, who experience gender-specific cultural pressures due to deeply rooted patriarchal norms. Using Attachment Theory, Family Systems Theory, and Cultural Values Theory, this research aims to fill a critical gap in understanding how family expectations impact college location decisions and mental health outcomes, such as anxiety and depression.

**Purpose of Research:** The study aims to examine:

1. The influence of familial expectations on proximity-related decisions among South Asian female college students.
2. The relationship between college-proximity decisions and mental health outcomes (i.e., Anxiety and Depression)
3. The coping strategies South Asian female college students employ in response to proximity-related stress, and how these strategies are associated with their mental health outcomes.

**Methods:** A cross-sectional, anonymous, quantitative survey was conducted among South Asian female college students in the U.S. The survey assessed familial expectations, proximity-related decisions, mental health outcomes, coping strategies, and perceived family attachment. Validated instruments include the Asian Values Scale-Revised (AVS-R) (cultural values), Depression Anxiety Stress Scales (DASS) (mental health), and Inventory of Parent and Peer Attachment (IPPA) (family attachment). Recruitment targeted universities with large South Asian populations, utilizing student organizations and social media. Descriptive statistics and regression modeling analyzed the relationships between familial expectations, proximity-related decisions, mental health outcomes, and coping strategies.

**Preliminary Conclusions & Findings:** Preliminary findings suggest that heightened familial expectations significantly influence students' decisions to remain close to home, often leading to increased anxiety, depression, and feelings of guilt.

**Implications of Findings:** Findings will contribute to understanding mental health disparities among South Asian college students and inform strategies to support their academic, emotional, and professional well-being.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## A content analysis of newspaper coverage of mass shootings in the United States

**Background:** Firearm violence is a major public health issue in the United States. To better understand how and what types of firearm violence prevention strategies are communicated to the public by the media, a content analysis of online newspapers was conducted. The extent to which a public health frame was incorporated was analyzed and prevention strategies mentioned by articles were categorized.

**Methods:** The ProQuest U.S. Newsstream database was searched for newspaper articles published between January 2022 and December 2023 by five U.S. newspapers on three specific mass shootings. Articles were selected based on inclusion and exclusion criteria. A codebook was adapted to include codes for public health framing and social ecological model level of interventions mentioned in the news articles.

**Results:** Most articles included at least one element of a public health frame (59.5%). Prevention strategies and solutions were included in 36 of 79 articles and specific types of strategies were included in 21 articles. Of articles that included a specific prevention strategy, the majority (24.1%) included a prevention strategy at the societal/policy level of the socio-ecological model.

**Conclusion:** Journalists include elements of a public health frame in reports of mass shootings; however, the inclusion of a comprehensive public health frame is limited. Incorporating a public health frame in online newspaper reports of mass shootings allows journalists to disseminate important prevention messaging to the public as an effort to mitigate firearm violence.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Trans-Care: Transgender Male Cervical Cancer Awareness and Reproductive Education Program

**Background:** With the advancement of biomedical treatment and prevention options like human papillomavirus (HPV) vaccines, regular screenings, and appropriate follow-up care, cervical cancer (CC) is a highly preventable disease. Yet, each year in the United States (U.S.), over 11,000 new cases of CC are diagnosed, and approximately 4,000 people die of the disease. In particular, CC screening rates among transgender men (TM) are alarmingly low, with only 56% receiving screening, compared to 72% of cisgender women receiving screening. Regardless of gender identity, routine screenings for CC are essential for all individuals with a cervix, including the large population of TM who have not had a hysterectomy. While TM often faces several risk factors for CC, such as sexual risks, multilevel discrimination, lack of inclusive healthcare, and reduced knowledge about CC screening, research on CC screening among TM is very limited.

**The Purpose of Your Research:** The current study aims to use a community-engaged approach to develop and evaluate a web-based campaign to increase CC screening awareness and practices among TM in the DMV, an area with a higher-than-average proportion of transgender populations (2.77) %.

**Methods:** We are conducting semi-structured interviews with thirty professionals in the DMV area who work directly with TM. Participants include healthcare providers, case managers, and researchers. We recruited participants through Whitman-Walker's professional network and subsequent snowball sampling. A thematic analysis will be used to develop codes and establish themes among the interviews.

**Findings & Conclusions:** While data collection and analysis are ongoing, the initial interviews revealed that providers offer TM patients self-testing and use a gender-affirming approach to discuss sensitive topics. Providers give their patients the freedom to decide what terms describe anatomical parts. Additionally, there are gaps in cc knowledge and resources, specifically in the DMV. Our study highlights important strategies for improving CCS screening among TM, with providers offering self-testing options and using gender-affirming language that allows patients to define terminology for their anatomy

**Significance of the Research:** The identified knowledge and resource gaps in the DMV area highlight the need for the web-based campaign that addresses a significant health disparity– TM's screening rates are 16% lower than cisgender women's, despite their higher prevalence of sexual risk behaviors. By using a community-engaged approach in an area with a higher-than-average transgender population, this research addresses the gaps in the literature and has the potential for meaningful local impact.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Strengthening Community Reach and Equity through Engaging Neighborhoods (SCREEN) in the National Capital Region

**Background & Significance:** The COVID-19 pandemic saw a steep decline in cancer screening rates, exacerbating existing disparities in secondary prevention access. Delays in screening contribute to later-stage cancer diagnosis and higher mortality, specifically for marginalized communities.

**Purpose:** GW Cancer Center (hereafter referred to as Cancer Center) aimed to develop a Neighborhood Health Ambassador (NHA) network comprised of representatives from four priority populations (African immigrant, African American, Latina, and queer communities) to serve as community champions promoting breast cancer screening in our catchment area.

**Research Question:** How can community members trained as community health workers increase capacity for Cancer Center community engagement?

**Methods:** Twenty-six NHAs completed 100 hours of a Community Health Worker curriculum. Upon completion, NHAs received \$1500 and began 44 hours of supervised practicum experiences (\$23-25/hour). In the direct service phase, a portion of the NHA cohort began independently identifying eligible under-screened women in their communities. When NHAs identified individuals without a primary care provider, staff from the Cancer Center set up new patient appointments to establish a medical home before mammography.

**Findings:** NHAs reached 2,189 direct beneficiaries at 108 events in a year of direct service. They identified 230 community members interested in cancer screening or primary care. Cancer Center staff undertook patient navigation in both English and Spanish and successfully navigated 20 of the 230 community members to mammograms. Patient navigation in Spanish uncovered an opportunity to better serve uninsured Latinas. We pivoted to cover out-of-pocket costs for uninsured women by funding campaigns with partner organizations, which helped secure mammograms for an additional 101 women without insurance.

**Conclusions:** Project SCREEN pilots a novel community-based network to advance catchment goals for outreach and engagement. Community members needed multiple interactions to facilitate linkages to health services and mammography. Overall, partnership with existing community organizations greatly expanded our capacity for impact through all-day mammogram campaigns focused on uninsured women.

**Implications:** While high-touch patient navigation is labor-intensive, it is crucial to link residents to primary care providers for referrals pathways. Empowering community champions and nurturing strategic partnerships may be two strategies to cement cancer prevention and early detection in the communities that need it the most.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

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## Reasons, perceptions, and recommendations: Characterizing medical cannabis use among a cohort of young adults in the United States

**Background:** Recent policy changes in states across the US have increased access to cannabis use for both medical and non-medical ('recreational') purposes, including among young adults.

**Purpose:** This study explored reasons for cannabis use among a sample of US young adults.

**Methods:** This study analyzed cross-sectional data from an ongoing longitudinal study among young adults (ages 18-34) in the US. We specifically focused on Spring 2024 data among those reporting past 6-month regular cannabis use (n=1460) and analyzed reasons for use (e.g., medical, non-medical), specific conditions/symptoms related to medical use, and experiences with cannabis for medical use. Analyses were coded in Microsoft Excel using descriptive and summary statistics for quantitative data, and inductive thematic analysis for qualitative data.

**Findings:** Overall, 6.3% (n=95) used regular cannabis only for medical purposes, 12.7% (n=193) primarily medical and occasionally non-medical, 26.6% (n=404) equally for both, 14.3% (n=218) primarily non-medical and occasionally medical, and 36.2% (n=550) only non-medical. Among those reporting medical use at least occasionally (59.9%, n=910), the most common reasons included chronic pain (n=328, 36%), migraines (n=301, 33.1%) and PTSD (n=292, 32.1%). Qualitative data indicated that most cannabis users felt positively about the effectiveness of cannabis on their health concern (n=681, 74.8%). Only 20.2% (n=184) reported that their cannabis use was recommended by a provider.

**Implications of Findings:** Among this young adult sample reporting regular cannabis use, medical use was common and aimed at reducing various symptoms. Understanding the reasons young adults use cannabis is critical to informing policy and public health strategies to optimize health while minimizing adverse outcomes.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Burnout Among U.S. Midwives: A Cross-Sectional Quantitative Study

**Background:** The state of maternal health in the United States (U.S.) is dire, with the highest rate of maternal mortality among all high-income nations. It's in this challenging context that midwives, with their crucial role in preventing up to 41% of these deaths, deserve our utmost respect. Yet, a midwife shortage and high estimated rates of burnout among the profession pose significant challenges. This U.S.-based study explores midwives' level of burnout and the perceived factors contributing to their burnout, considering the recent COVID-19 pandemic, the *Dobbs* decision, and the maternal mortality crisis.

**Methods:** An anonymous web-based cross-sectional survey was conducted among midwives in the United States (U.S.) Data was collected utilizing the Maslach Burnout Inventory-Human Services Survey (MBI-HSS) and a ranking of grouped burnout factors. The mean scores for the MBI-HSS and the weights for ranking the grouped burnout factors will be obtained. These relationships will be analyzed using univariate statistics and multivariable models.

**Results:** 107 participants completed the survey. Univariate and bivariate analyses will examine the mean scores for the MBI-HSS and the weights for the grouped burnout factors ranking. We expect preliminary results by Research Day on April 16, 2025.

**Conclusion:** This research is significant because although burnout among healthcare workers has generally been studied, little research exists on burnout among midwives specifically. The findings from this study will be invaluable in designing future public health interventions that aim to enhance the health and well-being of midwives and the broader maternal and child health workforce.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Virginia Title V Needs Assessment: GW Partnership

**Background:** Every five years, a needs assessment is conducted across the state of Virginia to identify and prioritize maternal and child health needs, with the ultimate goal of developing the Title V Block Grant Strategic Plan and renewal of funding for the Virginia Department of Health (VDH) Title V funding.

During the FY 2021-2025 work plan year, specifically in the final two years of the work plan, VDH partnered with the GW Maternal and Child Health Center of Excellence to gather a team of qualitative and quantitative researchers to aid in this effort.

**Methods:** The Title V team, along with MPH student fellows from GW, began the needs assessment process in early 2024. The needs assessment consisted of four key methods of data collection: MCH indicators, the stakeholder survey (n=500), key informant interviews with 96 stakeholders, and 19 focus groups with adult and adolescent members of Virginia's maternal and child health population. The VDH team took on a multi-methods approach to the needs assessment in order to gather sufficient feedback about the Title V MCH program.

**Results:** Our assessment identified six key themes that influence maternal and child health outcomes in Virginia: health care & service needs, experiences in accessing care, transitions in care, sensitivity for and respect of values, community perceptions of local health departments, and VDH priorities from participants' perspectives. Within each theme, we found specific barriers, facilitators, and opportunities for improvement that will guide policy recommendations for the next 5-year state action plan.

**Conclusion:** Through this partnership, the Title V team was able to conduct an extensive needs assessment to determine the state action plan for the next five years. Additionally, GW students were able to use skills learned in the classroom in a real-world setting.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Cannabis Social Equity Initiatives Across Five US States: Case Studies of Colorado, Washington, Massachusetts, Connecticut, and Missouri

**Background:** Given the historic cannabis-related injustices in the US, several states that have legalized non-medical cannabis have also launched social equity initiatives involving criminal justice reform, industry participation assistance, and community reinvestment programs. We explored these initiatives via case studies across 5 states: Colorado, Washington, Massachusetts, Connecticut, and Missouri.

**Methods:** Using a drug policy framework, 2 researchers dual-coded cannabis-related equity policies pertaining to expungements/pardons, industry participation, and revenue allocation (in October-December 2024).

**Results:** Colorado, Washington, and Massachusetts implemented pardons for certain offenses; Connecticut and Missouri implemented expungement. There was variability in the eligible offenses and numbers of pardons and expungements granted across states. Regarding industry participation, the states' social equity eligibility criteria were similar, albeit some distinctions (e.g., income restrictions, veterans). Each state either reserved licenses for social equity applicants or had specific social equity licenses. The states offered similar trainings but used distinct approaches (e.g., accelerator programs, role-specific tracks). Additionally, financial benefits differed across states (e.g., grants, loans, fee waivers/discounts). Each state implemented cannabis sales taxes, which varied in level (6% in Missouri to 37% in Washington) and application (e.g., differences by product type [Connecticut]). Revenues across states were directed to cannabis program costs, the general fund, and healthcare and educational initiatives and organizations, although there were differences in allocation across states.

**Conclusions:** Findings highlight the important efforts these states have made toward social equity goals. However, given the varied approaches and limited evidence base, ongoing evaluation across states is needed to inform effective future social equity initiatives.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

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## Profiles Of Cannabis And Tobacco Product Use Among Us Young Adults

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**Background:** Given high cannabis and tobacco use and co-use rates in the US, we examined young adults' cannabis and tobacco use profiles and related sociodemographic and psychosocial factors.

**Methods:** We conducted latent class analysis (LCA) on 2023 survey data among 2,267 US young adults ( $M_{age}=26.29$ ) reporting past-month tobacco or cannabis use. Indicators were: past-month days of cannabis, cigarette, and e-cigarette use (0, 1-10, 11-30) and any cigar, hookah, smokeless tobacco, and nicotine pouch use. Multivariable multinomial logistic regression examined sociodemographics, adverse childhood events, mental health symptoms, and personality characteristics in relation to use class.

**Results:** Classes included: 1) primarily cannabis (36.6%): all used cannabis (74.0% infrequent), <14% tobacco products; 2) frequent cannabis-cigarette (34.2%): 86.7% used cannabis (82.9% frequent), 65.9% cigarettes (51.6% frequent), 59.4% e-cigarettes (33.6% frequent), 36.5% cigars, 27.9% hookah, 1.4% chew, and 3.1% nicotine pouches; 3) product-dabbling (16.0%): 79.8% used cannabis (all infrequent), 71.8% cigarettes (57.1% infrequent), 66.7% e-cigarettes (51.9% infrequent), 39.1% cigars, 27.9% hookah, 9.3% chew, and 14.1% nicotine pouches; 4) frequent poly-product (7.7%): 93.9% used cannabis (57.9% frequent), 90.9% cigarettes (45.2% frequent), 98.2% e-cigarettes (58.5% frequent), and >84% other tobacco; and 5) primarily e-cigarette (5.5%): all used e-cigarettes (51.0% frequent), <9% cigarettes or nicotine pouches, and 0% cannabis or other tobacco. Class 4 (deemed highest risk) was older and more likely male vs Classes 1 and 5, Black (vs White) vs other classes, and Hispanic vs Classes 2 and 5; less likely sexual minority vs Classes 1-3 and in legalized states vs Class 1; reported more mental health symptoms vs other classes and more ACEs vs Classes 1, 3 and 5; and indicated higher extraversion vs Classes 1 and 5 and higher neuroticism and less openness vs Classes 1 and 2.

**Conclusions:** Findings underscore the importance of addressing poly-product use, particularly frequent use, among young adults, given the potential disparities and adverse outcomes.

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# GWSPH RESEARCH SHOWCASE

# PREVENTION AND

# COMMUNITY HEALTH

## Academic Pressure and Stigma: Impacts on South Korean College Student Mental Health in the U.S.

**Background:** Adolescent mental health issues are rising in South Korea, driven by academic pressure, stigma, and gender-based expectations. According to national data, 37.2% of teenagers report severe stress, and 25.1% report prolonged depressive symptoms. Female adolescents aged 14–19 are 2.9 times more likely than their male peers to be diagnosed with generalized anxiety disorder, a trend linked to academic and social factors. These stressors often persist as students transition into college, particularly for South Korean students studying abroad. However, limited research has explored how these pressures manifest among Korean international students in the United States and affect help-seeking behaviors and access to mental health services.

**Purpose:** This study examines how cultural perceptions in South Korea, particularly norms around academic achievement and stigma, affect psychological stress and help seeking behaviors among Korean young adults.

**Methods:** This ongoing mixed-methods study combines a literature review, structured surveys, and qualitative interviews with South Korean college students aged 18–25 enrolled in U.S. institutions. Key variables include academic pressure, mental health stigma, awareness and utilization of campus-based mental health services, and gender-related differences. A five-point Likert scale was used to assess perceived stigma. As of April 2025, five participants (four female, one male) have been enrolled, with a target sample size of 8–10.

**Results:** Preliminary findings indicate that 80% (n=4) of participants reported experiencing high levels of academic pressure, while 20% (n=1) described their academic stress as moderate. Of the participants, 20% noted they experienced extremely high degrees of stigma related to their mental health needs, with a further 60% experiencing significant degrees of stigma. Participants commonly referenced cultural expressions such as “fragile mind” or “mental weakness” as reasons for their reluctance to seek mental health support. In terms of service awareness, 40% of students were unaware of available mental health services, 40% were fully aware, and 20% reported partial awareness. Only 20% (n=1) had previously accessed mental health services. The current sample is predominantly female (n=4), and continued recruitment is ongoing to improve gender balance and sample size.

**Conclusion:** Preliminary data suggest that high academic expectations and pervasive stigma contribute to significant mental health challenges among South Korean international students in the U.S. Despite the availability of campus resources, awareness and utilization remain low. These findings underscore the need for culturally responsive outreach strategies and improved accessibility of mental health support services tailored to international student populations.

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# GWSPH RESEARCH SHOWCASE

## PREVENTION AND COMMUNITY HEALTH

### Mapping Educational Competencies: Proposing a Tool to Improve Physician Assistants' Abilities to Help FGM/C Survivors

**Background:** Female genital mutilation/ cutting (FGM/C) is the cutting, mutilation, or removal of parts of external female genitalia for non-medical reasons. It is usually performed on girls under the age of 15 and is practiced in many parts of the world. Similar to other forms of abuse, healthcare providers, including physician assistants (PAs), need specialized training to adequately anticipate possible complications and help support their patients. The George Washington University hosts an educational toolkit online that explains what FGM/C is and the complications that come with it. This investigation set out to see if the educational material on the FGM/C toolkit adequately addresses the competency areas that practicing PAs need. Additionally, the investigation sought to determine how these competencies could be applied to a case study for PA Students.

**Methods:** The seven competency categories listed by several major national PA organizations, including the PA Education Association, were mapped to the 17 educational competencies from the FGM/C toolkit website. The toolkit's educational materials were then analyzed to see if the materials adequately addressed all of the competencies.

**Results:** The concept map reveals a significant but incomplete overlap between the educational competencies listed on the FGM/C toolkit and the competency areas required of practicing PAs. Knowledge for practice (PA competency 1) and interpersonal skills (PA competency 2) are addressed by over half of the toolkit competencies. There was some limited guidance for addressing interprofessional collaboration (PA competency 4). However, there was a lack of guidance for addressing practice-based learning and quality improvement (PA competency 6).

**Conclusion:** The FGM/C toolkit is one resource to help improve PAs' abilities to care for women and girls who have undergone FGM/C, but does not have enough guidance to address all competencies. The findings also suggest that PA student education is necessary to meet competencies in the curriculum. This provides strong support for piloting a case study to teach PA students how to provide care for people who have undergone FGM/C.

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# **GWSPH RESEARCH SHOWCASE**

# **PREVENTION AND**

# **COMMUNITY HEALTH**

## **Protecting Women and Girls in Crisis: Understanding the Relationship between Displacement & FGM/C in Kenya**

Female genital mutilation/cutting (FGM/C) refers to any procedure that involves the partial or complete removal of the external female genitalia, or any other type of harm on the female genital organs for non-medical reasons (WHO). FGM/C is a significant public health issue, causing physical, psychological and societal consequences. In Somalia, over 99% of women between the ages of 15 to 49 years old have undergone FGM/C, with type III, the most severe form, being the most common (FGM/C Research Initiative). Since 2011, Somalia has faced seasons of drought resulting in famine, and armed conflict ultimately resulting in the mass displacement of thousands of Somalis, including women and girls (Concern USA). FGM/C often persists in conflict settings as families seek to maintain their cultural identity in times of instability, worsened by economic challenges and fragmented social systems. Therefore, this study explores the association between displacement in Somalia and the prevalence of FGM/C in Kenya, a neighboring country which inhabits a large population of Somali refugees.

This study hypothesizes that the mass displacement of Somalis due to humanitarian crisis will lead to an increase in the prevalence of FGM/C in Kenya's North Eastern region which borders Somalia and has the largest number of Somali refugees. Data from the Demographic Health Survey of Kenya 2008, 2014, and 2022 will be analyzed using the SPSS application. Descriptive and comparative analyses will identify trends in prevalence over the years, while logistic regression will evaluate the effect of marital status, education level, and perceived advantages of FGM/C on its continuance.

Based on preliminary secondary analysis, the prevalence of FGM/C in the North Eastern region of Kenya consistently increased from 2008 to 2014 to 2022. The results of this research seek to close gaps in the existing literature pertaining to FGM/C in humanitarian settings, inform culturally appropriate interventions and bolster global efforts to cease FGM/C. This study will provide insight to promote the health and rights of women and girls around the world.

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# Doctor of Public Health

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# GWSPH RESEARCH SHOWCASE

# DOCTOR OF PUBLIC

# HEALTH

## Optimizing Electronic Health Record Modernization Planning: A Facility-Led Quality Improvement Assessment

**Background & Purpose:** The NIH Clinical Center is modernizing its 20-year-old CRIS EHR to address multiple challenges. Staff have reported poor workflow integration as a major barrier, potentially impacting patient safety and clinical quality.

**Research Questions:** Using the SEIPS framework, the assessment examined CRIS EHR integration challenges, how workflow analysis can inform future improvements, and participants' experiences with workflow modeling and redesign.

**Methods:** The assessment reviewed existing user satisfaction surveys, observed workflow modeling sessions, and surveyed 85 subject matter experts to assess EHR integration challenges. A cross-dataset comparison identified seven key themes, including standardization, interoperability, and training. These insights highlighted barriers and opportunities for improving EHR integration.

**Key Findings:** The assessment identified several EHR-workflow challenges. A review of existing data revealed issues such as clunky data entry, delays in accessing information, and complex navigation. Workflow modeling further highlighted problems with data standardization, system integration gaps, and inconsistent user knowledge. While participants found workflow modeling effective in capturing workflow complexities, concerns emerged about the limited diversity of subject matter experts. Triangulating data from multiple sources confirmed consistent themes, strengthening the study's findings.

**Recommendations:** To optimize EHR usability and integration, the system should be tailored to align with NIH Clinical Center workflows. Standardized protocols for capturing, storing, and retrieving medical data will enhance efficiency and consistency. Strengthening interoperability will improve data sharing across systems, reducing workflow disruptions. Additionally, comprehensive training programs are essential to minimize administrative burdens and ensure effective system adoption.

**Broader Implications:** The assessment findings apply beyond EHR implementation to digital health technologies, including eHealth applications, Internet of Things (IoT) devices, telemedicine platforms, and mobile health tools, all of which require seamless data integration and interoperability. EHR modernization also supports public health initiatives like Public Health 3.0 by enabling data-driven decision-making for disease surveillance and outbreak response. Additionally, it enhances Clinical Decision Support Systems (CDSS) by using artificial intelligence (AI) and machine learning to provide real-time, evidence-based recommendations to clinicians.

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# GWSPH RESEARCH SHOWCASE

## DOCTOR OF PUBLIC HEALTH

### A Qualitative Analysis of Factors Impacting Adherence to Pediatric Concussion Care Recommendations

**Statement of Purpose.** While concussion care recommendations are more widely implemented, disparities in adherence and recovery trajectories persist. We sought to explore patient and caregiver-perceived barriers and facilitators impacting adherence to pediatric concussion care recommendations.

**Methods/Approach.** We conducted interviews with patients 12-18 years and caregivers of patients 5-18 years who were seen at a primary care clinic within a pediatric healthcare network for a concussion between September-December 2019 and were subsequently lost to follow up for their clinical care. Interview domains included pre-clinical care, experiences with the healthcare system, clinical care, barriers with adhering to care recommendations, outcomes, and suggested improvements. We performed a deductive and inductive approach to thematic analysis.

**Results.** Nine patients and caregivers participated, reflecting experiences of five patients. Patient characteristics included females (N=3), mean age of 12 years, identified as non-Hispanic White (N=3), and privately insured (N=3). Participants reported positive experiences with clinical care and felt involved in their care. Barriers included challenges with schools failing to accept accommodation requests, patients not completing in-home exercises, and financial and logistical challenges in accessing specialty care.

Participants reported improving on the visio-vestibular exam during clinical assessments and demonstrations of in-home exercises helped with their adherence to care recommendations. Suggested ways to increase adherence to recommendations included improving schools' responsiveness to accommodation requests, helping caregivers understand injury severity, and encouraging patients to advocate for themselves.

**Conclusion.** While patients had positive healthcare experiences during their concussion recovery, challenges existed in accessing specialty care, limited adherence to in-home exercises, and schools resisting accommodations. These barriers may exacerbate disparities in concussion recovery and require continued study.

**Significance/Contribution.** These findings identify potential barriers and facilitators in adherence to concussion recovery recommendations at both the individual and systemic level, which require developing tailored interventions to reduce disparities in care and achieve equity in recovery.

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# GWSPH RESEARCH SHOWCASE

# DOCTOR OF PUBLIC

# HEALTH

## A Preliminary Analysis of Injury Prevalence Among Children in Foster Care

**Background.** Children in foster care are a highly vulnerable population due to compounded adverse childhood experiences (ACEs), increasing their risk for short- and long-term health consequences. The American Academy of Pediatrics designates children in foster care as a special health care needs population, warranting a better understanding of the risk factors affecting their health. Injuries are of particular concern as they are the leading cause of death among children and adolescents (0-19 years old) in the U.S.; however, limited data is available on injuries among children in the foster care system.

**Purpose.** This study aims to assess the characteristics and prevalence of injuries among children in foster care seen across hospital networks in New Jersey (NJ).

**Methods.** Using data from the New Jersey Safety and Health Outcomes Data Warehouse, we examined the period prevalence of injuries among children in foster care identified from a single pediatric hospital network, from 2016 through 2022. We used descriptive statistics to characterize patient demographics, and logistic regression models were employed to assess the increased odds of injury based on demographic features.

**Results.** From 2016 through 2022, 826 patients were identified as being in foster care (53.6% male, median age at time of first foster care visit in analytic window = 3 years, interquartile range 0-8). Of those, 35.1% were non-Hispanic (NH) White, 31.5% were NH Black/African American, and 11.3% were Hispanic. The overall period prevalence of injuries was 16.3%. A statistically significant age difference was found between those with and without injuries ( $p=0.0034$ ), with the odds of being injured increasing by 4.7% for each one-year increase in age. While no statistically significant differences in injury frequency were observed by sex or race/ethnicity, there were trends in increased odds of obtaining an injury among most racial/ethnic groups compared to NH White children.

**Conclusion.** The period prevalence of injuries in children in foster care was 16%, with notable disparities observed by age and observed trends by race/ethnicity. Further investigation is needed to understand and contextualize the burden of injury among this population.

**Future Directions.** Injuries among children in foster care are vastly understudied. Future research will include a comparative analysis of injuries with a control cohort (children not in foster care), assessing health visits across various hospital networks in NJ, disaggregating injury period prevalence (yearly), an examination of injury mechanism and severity, health care utilization, and community level measures, all framed within the Injury Equity Framework.

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# GWSPH RESEARCH SHOWCASE

# DOCTOR OF PUBLIC

# HEALTH

## Qualitative Exploration of Cancer Care Pathways and Factors that may Influence Guideline Implementation in Nigerian Healthcare Setting

**Background:** The implementation of cancer survivorship guidelines in resource-limited settings faces unique challenges. While the National Comprehensive Cancer Network (NCCN) has developed survivorship guidelines for sub-Saharan Africa, little is known about the contextual factors that may affect their implementation in Nigeria, which bears the second-highest cancer burden in Africa. This study's objective is to explore barriers and facilitators that may influence the implementation of NCCN survivorship guidelines based on perceptions, experiences, and attitudes of patients, caregivers, and healthcare providers at a major Nigerian cancer center using the Consolidated Framework for Implementation Research (CFIR).

**Methods:** The study employed qualitative methods and, through semi-structured interviews, collected data from 22 participants to explore their experiences and perceptions of the cancer care pathway in a Nigerian context. Data collection and analysis were guided by CFIR domains: inner setting, outer setting, intervention characteristics, and individual characteristics. Nine patients, nine healthcare providers, and four caregivers were interviewed.

**Results:** Key barriers that may impact implementation include limited awareness of survivorship guidelines among healthcare providers, significant human resource constraints, and financial-related challenges. In contrast, cultural and religious factors, along with effective communication, emerged as elements that could be leveraged in implementing guideline recommendations.

**Conclusion:** The study highlights the importance of assessing contextual factors prior to implementing guidelines developed outside of the specific context of application. It also identified barriers that may need to be addressed by adopting implementation strategies tailored to the unique realities of the study's site, as well as facilitators that could be leveraged to enhance the uptake and dissemination of the NCCN recommendations.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Exploring the relationship between physical activity and perceived health among undergraduate college students.

**Background & Significance of the Study:** Promoting physical activity is a key goal of public health in the United States, particularly given the rising rates of obesity. Engaging in regular physical activity and maintaining healthy eating habits enhance mental and physical well-being, reduce stress, improve cognitive function, and boost immune health. Exploring the relationship between perceived health and physical activity levels is imperative to designing interventions to reduce obesity. Understanding how individuals view their own health can help in designing programs to influence their engagement in regular physical activity and healthy eating.

**The Purpose of Your Research:** The purpose of this research is to examine the correlation between perceived health and self-reported physical activity levels among undergraduate college students. This study aims to identify patterns in physical activity based on self-reported health status and assess whether perceived health influences motivation to engage in regular physical activity. Additionally, the study seeks to compare perceived health, self-reported weight and height, and BMI classifications using a validated scale to evaluate the accuracy of health perception. Furthermore, this research will explore the impact of self-perceived health on lifestyle choices, including exercise habits, dietary decisions, and overall well-being. By analyzing these factors, the study aims to provide insights into how subjective health perceptions shape physical behaviors and health-related decision-making among college students.

**Methods:** This study employs a quantitative, cross-sectional survey to examine the relationship between self-perceived health and physical activity among undergraduate students. Data will be collected through an anonymous online survey via RedCap, assessing demographics, self-reported health indicators, and physical activity patterns. A sample of 25–30 students will be recruited through convenience sampling methods. Analysis will include descriptive statistics, BMI comparisons, and correlation tests. Ethical considerations include ensuring informed consent, confidentiality, and secure data storage. Findings will provide insights into how accurately students perceive their health and whether these perceptions influence physical activity and lifestyle choices.

**Preliminary Findings & Conclusions:** Research collection is in progress.

**The Implications of Your Findings and/or Revisiting the Significance of the Research:** This research highlights the importance of understanding how perceived health influences physical activity levels among undergraduate students. Findings may guide targeted interventions addressing psychological and behavioral influences on health activity, offering insights into promoting healthier lifestyles and improving overall well-being.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Micro-Interactions Between Students and Faculty Influence on Academic Motivation and Mentorship

**Background & Significance:** Micro-interactions—brief, informal exchanges between students and faculty—play a pivotal role in shaping students’ academic experiences. These interactions, often overlooked in formal education frameworks, can foster a sense of belonging, reduce academic-related stress, and spark meaningful mentorships. Previous research underscores the significance of supportive academic relationships and their impact on mental health and motivation in higher education settings.

**Purpose:** This study investigates how informal faculty-student interactions, such as casual hallway conversations, influence undergraduate students’ academic motivation, perceptions of faculty approachability, and the development of mentorship relationships at The George Washington University.

**Methods:** The study employed a self-report survey administered to undergraduate students who had experienced informal interactions with faculty outside of structured academic settings. Recruitment was facilitated through digital outreach and peer referrals. The survey measured constructs such as academic motivation, belonging, faculty approachability, and mentorship development, with content validity ensured through review by the Office of Student Engagement.

**Findings & Conclusions:** Findings indicate that micro-interactions consistently enhance students’ academic motivation, sense of community, and engagement with faculty. All participants reported feeling at least “moderately motivated” after such interactions, and 100% indicated a heightened sense of academic belonging. Additionally, 76% of respondents considered new academic or career trajectories following these interactions, and most reported mentorship opportunities arising as a result. The study concludes that even brief exchanges can serve as catalysts for deeper academic engagement and emotional support, though it acknowledges potential limitations, including self-report bias and a homogenous participant pool primarily from the research class.

**Implications:** These results highlight the transformative potential of informal student-faculty connections. Institutions should encourage faculty to foster approachable environments and prioritize casual engagement as a tool for student development. Recognizing micro-interactions as meaningful educational touchpoints can help reshape the culture of higher education, making it more inclusive, motivational, and supportive.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Understanding Cognitive Disparities Through the Lense of Neighborhood Deprivation in Clinical Neuropsychology

**Background:** Clinical neuropsychology provides objective assessments of cognitive functioning and plays a critical role in diagnosing and treating brain-based disorders. More recently, researchers and clinicians acknowledge the importance of contextual factors, such as neighborhood environments, in shaping cognitive test performance. The Area Deprivation Index (ADI), a validated composite metric of socioeconomic disadvantage, allows for the examination of how the environmental context of an individual influences neuropsychological outcomes. While prior studies have shown associations between higher ADI and poorer cognitive functioning, few have evaluated this relationship in clinical samples. To fill this gap in the literature, this study will assess whether an indirect relationship exists between ADI and cognitive functioning across seven domains.

**Methods:** This study utilized neuropsychological test data from patients who underwent neuropsychological testing at The George Washington MFA Department of Psychiatry and Behavioral Sciences between 2016 and 2023. The dataset included a diverse population from the greater DMV area. Cognitive function will be assessed using measures of global cognition, visuospatial abilities, attention, memory, language, processing speed, and executive function. ADI scores on the national and state scale are used to quantify neighborhood deprivation, consisting of 17 sub-matrices including median level of education, family income, SES, unemployment rates, etc. Seven linear regression models will be utilized to test the relationship of ADI across different cognitive domains.

**Results:** Analyses will examine the relationship between ADI and cognitive functioning across 7 domains to assess whether neighborhood disadvantage predicts poorer neuropsychological performance beyond demographic variables. Additional analyses are ongoing and will include exploring potential mediators or moderators of this relationship.

**Conclusions:** The findings of this study have the potential to add to the existing literature by demonstrating the extent that neighborhood deprivation can act as a meaningful predictor of cognitive performance in clinical neuropsychological assessments. Specifically, the results will strengthen the clinical importance of incorporating contextual variables, such as the Area Deprivation Index (ADI), into diagnoses and future treatments. This application will help reduce potential bias and enhance diagnostic accuracy, ultimately promoting more equitable neuropsychological practices and improving care for individuals from diverse communities.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Pitch, Patterns, and Parkinson's: Investigating Accelerated "Vocal Aging" and Gender Differences

**Background & Significance:** Progressive Parkinson's Disease (PD) alters vocal quality, resulting in increased jitter and shimmer. However, these same vocal changes also arise in the normal aging process, making it challenging to distinguish which changes are part of typical aging and which signal PD's accelerated effects on the voice. With rising interest in telehealth and remote diagnostics, understanding this distinction is especially relevant. Tools that measure specific acoustic markers—potentially assessed via smartphone or other mobile devices—could address inequities in healthcare access by bringing reliable PD screening to communities without specialized clinical resources.

**Purpose:** This project evaluates whether **locPctJitter** and **apq11Shimmer** can effectively differentiate PD-related vocal changes from those typically associated with aging. **locPctJitter** measures the percentage of frequency variation (jitter) across vocal cycles, reflecting irregularities in pitch. **apq11Shimmer** quantifies amplitude variability (shimmer) over 11 consecutive vocal cycles, capturing fluctuations in voice loudness. A secondary aim is to determine whether potential differences by gender are statistically significant enough to warrant distinct diagnostic considerations.

**Methods:** We analyzed a dataset of sustained vowel phonations from individuals with and without PD. Our focal acoustic variables, **locPctJitter**, and **apq11Shimmer**, underwent statistical comparisons (ANOVA, t-tests, and linear regression) to detect both group-level differences and gender interactions. Violin and box plots were created to visualize distributions and highlight effect sizes.

**Findings & Conclusions:** Analysis showed that PD participant data exhibited higher jitter and shimmer values than controls, with **locPctJitter** and **apq11Shimmer** emerging as especially significant markers. According to reference data (Spazzapan et al., 2024), older adults typically show no more than 1% jitter changes after age 50, whereas PD participants in our sample demonstrated increases approaching 2%. This notable gap suggests an accelerated "vocal aging" effect under PD. Although some gender-specific trends were observed (particularly elevated measures among females with PD), these differences were secondary to the main PD effect. Our findings highlight that these vocal biomarkers can help disentangle normal age-related vocal declines from those intensified by PD.

**Implications:** Adopting these two measures in telehealth or mobile-based evaluations could substantially aid early PD detection—especially in areas lacking specialists—while minimizing patient burden. Such remote diagnostic approaches might help parse normal aging from pathological changes, guiding timely interventions and supporting equitable access to neurological care.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### **Balancing Baby and Business: A Cross-National Analysis of Workplace Breastfeeding Policies: An Analysis of Policies Regarding the United States, Switzerland, and Morocco**

**Introduction:** This research paper explores both the global and country-level workplace breastfeeding policies. The study first focuses on the foundational guidelines put forth by the World Health Organization (WHO) and the International Labor Organization (ILO). Then it goes on to compare the United States, Switzerland, and Morocco examining federal policies, workplace accommodations, cultural norms, and healthcare initiatives. Primary and secondary data were collected, including interviews, the research adheres to the ethical guidelines of informed consent and confidentiality. Limitations were considered such as small sample size and lack of response to inquiries.

**Method:** The literature review establishes a foundation by analyzing the existing breastfeeding frameworks and policies in the workplace. The United States compares the federal policies to the state-level policies in both California and Mississippi. In Switzerland, the interplay between the national and cantonal policies was explored. Morocco reveals unique challenges in breastfeeding accommodations in the workplace. This was explored through the differences experienced between working mothers in the informal and formal economic sectors. A comparative analysis identifies differences in the policy design, cultural norms, and the integration of the Baby-Friendly Hospital Initiative (BFHI) influences on workplace breastfeeding accommodations and breastfeeding rates and duration.

**Conclusion:** The study concludes with innovative solutions for nations with underdeveloped workplace breastfeeding accommodations. It emphasizes the importance of integrating global guidelines into local settings to enhance breastfeeding policies, support breastfeeding mothers in the workplace, and improve maternal and child health outcomes overall.

**Key Words:** Workplace breastfeeding policies, Breastfeeding Rates, WHO (World Health Organization), ILO (International Labor Organization), Federal Policies, State-level Policies, Workplace Accommodations, Cultural Norms, Comparative Analysis, Baby-Friendly-Hospital Initiative (BFHI), Maternal Health, Child Health

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### How Does Part-Time Work Affect Chinese Undergraduate Students' Mental Health and Academic Performance?

**Background:** The increasing participation of Chinese undergraduate students in work-study programs and internships has raised concerns about the effects of part-time employment on mental health and academic performance. With rising education costs and an increasingly competitive job market, many students work out of financial necessity rather than choice. Existing research suggests that while moderate work hours can improve time management and discipline, excessive work commitments may lead to heightened stress and decreased academic engagement. Much of this research, however, concentrate on Western settings. This leaves a large knowledge gap about the experiences of Chinese students, who deal with particular institutional and cultural challenges related to work-study balance and mental health.

**Methods:** This study uses both surveys and interviews to understand how part-time work affects students. Approximately 100 Chinese undergraduate students will complete a short, five-minute questionnaire. Their job hours, academic standing, and mental health will all be self-reported in the survey. Additionally, the experiences of students with and without part-time jobs will be compared. The Perceived Stress Scale (PSS) will be used in the survey to evaluate how part-time students' social interactions and working hours evolve over time. To obtain a diverse perspective, the survey will be administered to students from across China. To learn more about their experiences and coping mechanisms, interviews with a smaller group of students will also be conducted. The gathered information will be examined to look for trends in academic achievement and job hours and mental health.

**Results:** Data collection is currently in progress. Interim findings will be available during GWSPH research day.

**Conclusion:** The findings of this research will provide valuable insights into the challenges Chinese undergraduate students face in balancing part-time employment with academic responsibilities. The goal of the study is to help government organizations and academic institutions create work-study and mental health assistance programs that are more successful. This study will help close the knowledge gap in the literature and advance our understanding of how part-time employment affects Chinese students' well-being. The findings have the potential to influence institutional modifications, including improving career development programs, raising awareness of work-study balance, and strengthening counseling services. Ultimately, this study may enhance students' academic performance and mental health outcomes in China's changing higher education environment.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Is Education Associated With Prenatal Maternal Anxiety And Depression

**Background:** Previous research has revealed the positive association between education attainment with mental health outcomes, specifically anxiety and depression.

**Objective:** To investigate the relationship between educational attainment with self-reported symptoms of anxiety, stress, or depression in a cohort of under resourced pregnant women.

**Design/Method:** We have enrolled 591 pregnant women in an ongoing randomized control trial to assess the efficacy of patient navigation/mental health/peer support interventions on perinatal mental wellness in a population of low-resourced Black and African American pregnant women within the District. Patients self-reported education and income levels and completed Generalized Anxiety Disorder - 7 (GAD-7), Perceived Stress Scale (PSS), and Edinburgh Postnatal Depression Scale (EPDS) surveys at enrollment.

**Results:** Most participants reported a household income level less than \$10,000 (49%) and the most common educational level achieved was high school diploma/GED (54%). Mean anxiety score was 5.5( $\pm$ 5.0), stress score was 14.9( $\pm$ 7.6) and depression score was 7.6( $\pm$ 5.2). There was weak negative but significant correlation between educational attainment and depression (EPDS,  $r = -0.0932$ ,  $p = 0.0312$ ); education level was not significantly correlated with stress (PSS,  $r = -0.0569$ ,  $p = 0.198$ ) or anxiety (GAD,  $r = -0.0619$ ,  $p = 0.161$ ).

**Conclusion:** Unlike previous reports, we did not find a strong correlation between maternal education and perinatal mental health scores. It is also important to consider what study methods were used in the other published literature compared to the current study because this was a randomized controlled trial compared with cross sectional studies.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Burnout and Adverse Childhood Experiences in the Maternal and Child Health Workforce

**Background:** To improve the Maternal and Child health outcomes in the United States, the workforce needs to be highly trained, community-oriented, and culturally humble. Rates of burnout have significantly increased since the COVID-19 pandemic, causing a shortage in the workforce, which directly impacts patient outcomes. There is new evidence to suggest that healthcare providers that have at least one Adverse Childhood Experience (ACE) are at an increased risk of burnout. This study aims to determine the relationship between burnout and ACEs in the MCH workforce and determine if the MCH has a higher prevalence of ACEs.

**Methods:** An anonymous cross-sectional survey was conducted through Qualtrics. Eligible participants were 18 years or older, currently working in the MCH workforce (full-time and part-time), and practicing as a clinician for at least one year. The MCH workforce was defined as a provider who works with maternal and/or child health populations (doulas, midwives, OB/GYN, primary care providers, labor and delivery nurses, pediatricians, and family providers). An ANOVA test will be used to test for significance.

**Results:** Data collection is still in progress. Preliminary results will be completed by research day.

**Significance:** By uncovering the relationship between ACEs and burnout, our study will pave the way for more targeted programs to combat burnout in the MCH workforce. Furthermore, it will furnish additional evidence of the impact of ACEs on health outcomes and foster a deeper understanding of the caregivers for the most vulnerable populations.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Promises & Perceptions: Exploring Motivations and Misunderstandings About Supplement Use in College

**Background:** The Food and Drug Administration (FDA) classifies dietary supplements as food rather than drugs. This means manufacturers can introduce any product to market they consider safe, and the FDA only evaluates safety after a product has been released to the market and found to cause harm. In 2023, the dietary supplement industry grossed \$159 billion in the United States and continues to grow as consumers are persuaded to purchase supplements due to social media campaigns, celebrity endorsements, misleading nutritional claims, and trendy packaging. This study seeks to answer the following questions: (1) *What level of knowledge do George Washington students have about dietary supplements, and (2) why do these students choose to take supplements?*

**Methods:** This is a mixed-methods study that uses a convenience sample of George Washington undergraduate students of different class years and majors. Participants completed an online survey to understand if they currently or have ever taken dietary supplements, why they take supplements, how many of the supplements they take were recommended by a doctor, what supplements they take, if any supplements have ever given them an adverse reaction, and if they are aware that the FDA approves supplements as food rather than drugs. This survey includes both close-ended and open-ended questions.

**Result:** Data collection is ongoing, and results will be discussed at Research Day.

**Conclusion:** Understanding student supplement usage is important because many are unaware of the deceptive tactics used by the dietary supplement industry. Consequently, these young people are being encouraged to take supplements that are costly, potentially ineffective, or even harmful, to their overall health and well-being.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Chemo Brain in Cancer Survivorship: A Systematic Review of Chemotherapy-Related Cognitive Decline and Potential Mitigations.

**Background:** Cancer survivorship has seen significant improvements due to advancements in chemotherapy; however, one concern expressed by many patients undergoing this treatment is chemotherapy-related cognitive impairment (CRCI), often referred to as “chemo brain.” This condition is characterized by challenges with memory, attention, fatigue, and executive function. Overall, CRCI ultimately affects daily life and overall well-being. Research on neurological function has identified the causes of CRCI, linking it to neurological damage caused by the chemicals used in chemotherapy. Despite its relatively common nature and its effects on quality of life, there is a notable gap in research aimed at exploring strategies to alleviate this condition.

**Purpose:** We conducted a systematic review to investigate how nutrition and other lifestyle interventions might influence chemotherapy-related cognitive impairment, with the objective of identifying potential strategies to enhance the quality of life for cancer survivors.

**Methods:** This systematic review was conducted in alignment with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses’ Extension for Scoping Review (PRISMA-ScR) statement (Tricco et al., 2018). Through an in-depth search in PubMed, Scopus, and Science Direct, 148 articles were retrieved fitting the topic. Using Covidence, an online database tool used to assist in systematic reviews, the duplicates and irrelevant articles were excluded. Through further analysis, 13 studies were identified that fit the inclusion criteria. Data was extracted from these 13 articles to inform current practices and evidence to address current lifestyle and nutrition practices associated with CRCI interventions.

**Findings:** The studies reviewed highlight symptoms of fatigue, sleepiness, and exhaustion as primary concerns. These symptoms influence cognitive performance in cancer survivors. Additionally, memory and executive function have been identified as cognitive impairments secondary to CRCI. Key findings include: (1) inconsistencies in cognitive assessment methods, (2) diet and exercise as common lifestyle interventions for managing cognitive impairment, and (3) the need for further research on targeted strategies to address chemotherapy-related cognitive impairment (CRCI).

**Conclusion:** Through these findings, the systematic review revealed the potential role of diet and exercise in managing CRCI. However, the inconsistency of methods and cognitive measurements established a need for further research to strategically address CRCI through lifestyle interventions. Through this systematic review, it is understood that a deeper understanding of the relationship between nutrition, exercise, and cognitive resilience could lead to more effective, evidence-based interventions that enhance survivorship outcomes.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Contributing Factors to Diabetes Prevalence Across Rural Maryland Counties: Strategies for Success

**Background:** Type II diabetes is a chronic condition typically developed in adults over 35 and is closely linked to high blood pressure, poor nutrition, and lack of physical activity. In Maryland, 10.5% of adults have diabetes. The disease is particularly prevalent in rural areas such as the Eastern Shore, where limited access to healthcare worsens existing health disparities. Dorchester, Somerset, and Worcester Counties have the highest diabetes prevalence rates in the state. However, despite similar geographic and health challenges, Wicomico County has maintained a lower diabetes prevalence than its neighbors, suggesting that environmental and social factors may contribute to this disparity.

**Purpose:** This research is essential for understanding the environmental health factors and social determinants that contribute to the lower prevalence of diabetes in Wicomico County compared to the neighboring Dorchester, Worcester, and Somerset Counties. This study aims to identify similarities and differences between the counties to understand what leads to variable rates of diabetes prevalence.

**Methods:** This research uses a quantitative trend analysis of data from Healthy Delmarva, the Maryland Department of Health, County Health Rankings, and local Community Needs Assessments (2020-2025). Guided by the Socio-Ecological Model (SEM), it examines healthcare access, race, socioeconomic status, food security, education, and the built environment's impact on diabetes prevalence. Demographic and health metrics were analyzed to identify patterns between the four counties. The SEM framework evaluates individual, interpersonal, community, and policy-level factors affecting diabetes rates.

**Findings:** The study's findings highlighted the individual differences across each county and compared them to the other counties analyzed. Each county exhibited unique health indicators and factors contributing to its diabetes prevalence. The data revealed that Dorchester and Somerset Counties shared similar health indicators, while Worcester County displayed similarities to Wicomico County and the State as a whole.

**Conclusion:** The analysis of social determinants of health and environmental factors on diabetes prevalence in Wicomico, Dorchester, Somerset, and Worcester Counties showed a correlation between diabetes rates and the counties' health indicators. This suggests that the increase in diabetes prevalence may be linked to a decline in social determinants of health and environmental factors. While no direct data was found to explain why Wicomico County has a lower prevalence, it can be inferred that health programming, geographical distance from healthcare, and other contributing factors play a role in the reduced diabetes prevalence compared to other areas. Additionally, further exploration into these factors is needed.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Understanding how knowledge of influenza influences beliefs about wearing masks

**Background:** This research explores the relationship between knowledge of influenza and beliefs about mask-wearing in undergraduate students at George Washington University. Mask-wearing has been a critical public health measure to reduce respiratory virus transmission. Literature highlights risk perception, belief in science, and social norms as factors that influence mask-wearing behavior. Studies have shown that higher perceived risk and belief in the efficacy of masks increase compliance to mask mandates, while perceived ineffectiveness and psychological resistance hinder adherence.

**Methods:** This cross-sectional study explored the relationship between influenza knowledge and mask-wearing beliefs among 24 undergraduate students at GWU. Participants were recruited via convenience sampling. 24 participants completed a survey adapted from a prior study exploring knowledge about influenza knowledge, and mask-wearing beliefs. Data analysis included descriptive statistics, correlation, and regression to assess links between knowledge and beliefs.

**Results:** Out of the 24 students that responded, 19 identified as women and were part of the school of public health. Most participants were knowledgeable about influenza with 91.7% correct responses, strongly agreed that masks reduce the risk of getting sick (20/24), and help promote safety (17/24). Further statistical analysis is in progress to identify possible association between knowledge of influenza and wearing masks.

**Conclusion:** Initial results suggest those with more knowledge of influenza are more likely to believe in its protection, which is aligned with research that correlates belief in science to wearing masks. Limitations include a small sample size and restricted generalizability due to lack of diversity among participants. This research seeks to provide insights into improving public health strategies during flu season and potential future pandemics. To better understand the association between knowledge and mask-wearing, studies with larger and more diverse sample sizes are needed.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Exploring the Relationship between Child Opportunity Index and Bayley-III Scores in Young Children

**Background:** A child's environment plays a crucial role in neurodevelopment, with research highlighting the significant impact of socioeconomic factors tied to geographic location. The Child Opportunity Index (COI) quantifies neighborhood-level influences at the metro, state, and national levels, offering a framework for understanding how geographic disparities affect child development. The Bayley Scales of Infant and Toddler Development (Bayley-III) is a widely used tool for assessing language, cognitive, and motor skills in early childhood. To our knowledge, this is the first study to examine the relationship between COI and Bayley-III developmental outcomes, highlighting the role of geographic-based socioeconomic disparities in shaping cognitive and language development in young children.

**Objective:** Explore the relationship between COI and Bayley-III scores to assess how a child's zip code influences developmental outcomes.

**Methods:** Data were obtained from 163 children enrolled in a developmental outcomes study in the Washington, DC metro area. Each child completed the Bayley-III between 2-3 years of age. Zip code data were used to determine COI scores, including overall scores and sub-scores across the Education, Health/Environment, and Social/Economic subdomains at metro, state, and national levels. COI scores are categorized into 5 groups ranging from "very high" to "very low." Linear and multiple linear regression analyses were performed to assess relationships between COI scores and Bayley-III outcomes at the metro level.

**Results:** Bayley-III and COI scores were obtained for 163 children, of whom 27% were White, 6% Black, 4% Asian, 55% other racial categories, and 8% unknown. Additionally, 64% of children were Hispanic or Latino. Lower COI scores correlated with reduced cognitive and language outcomes at the metro, state, and national level ( $p < 0.05$ ). The association between motor scores and COI levels was weaker, reaching significance only at national level ( $p = 0.018$ ). Sub-score analysis further reinforced these findings, showing significant associations for cognition and language outcomes but not for motor scores across Education, Health/Environment, and Social/Economic ( $p < 0.05$ ). These results indicate that COI scores are strongly associated with Bayley-III scores, with higher COI scores reflecting areas with greater resources and better developmental outcomes.

**Implications:** These findings underscore the need for targeted early childhood interventions in communities with lower COI scores to mitigate the impact of socioeconomic disparities on cognitive and language development. Policymakers and healthcare providers should prioritize resource allocation and support programs that enhance educational, health, and social environments in underserved neighborhoods to promote equitable developmental outcomes.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Promoting Responsible Research Practices: Implementing Strategies to Prevent Misconduct in Academic and Research Institutions for Effective Research Leadership

**Background:** Implementing proactive strategies to reduce the likelihood of misconduct within the institution is paramount. Research misconduct encompasses serious violations such as fabrication, which involves making up data or results; falsification, which refers to manipulating research materials or processes; and plagiarism, the unethical act of using someone else's work or ideas without proper attribution. These forms of misconduct threaten the integrity and reliability of the scientific process and have far-reaching consequences. They can tarnish the reputation of academic institutions, lead to the retraction of published papers, and significantly erode public trust in the validity of scientific research. Therefore, fostering a culture of integrity and accountability is crucial in maintaining the credibility of research initiatives.

**Purpose of Research:** This research aims to explore the importance of maintaining integrity and ethical standards in research practices. It examines proactive measures that research leadership can take to mitigate the risk of misconduct within their institutions, focusing on practical strategies to foster research integrity and prevent misconduct.

**Methods:** The study involves reviewing existing literature on research misconduct and its prevention, analyzing current policies related to research integrity, identifying best practices for promoting transparency and communication, developing oversight mechanisms for monitoring potential misconduct, exploring resources and support for researchers, and examining collaboration with external stakeholders.

**Findings & Conclusions:** Preliminary findings suggest a multi-faceted approach is crucial for preventing research misconduct. Key strategies include establishing clear policies defining research misconduct, implementing robust training programs, strengthening oversight mechanisms, fostering a culture of openness and accountability, providing necessary research resources, and collaborating with external stakeholders.

**Implications:** The findings underscore the vital role of high-level research leadership in preventing research misconduct. By implementing the outlined strategies, institutions can create an environment that values research integrity, promotes ethical conduct, and mitigates the risk of misconduct, thereby maintaining public trust in science and ensuring the reliability of research findings that inform policy decisions.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### The Global Burden of Mental Illness: A Policy Research Paper

**Background:** Mental illness is a complex public health issue influenced by various interconnected factors, including genetic predisposition, traumatic life events, substance abuse, and social determinants like poverty, discrimination, and access to healthcare. Elements such as genetics, brain chemistry, coping skills, relationships, and environmental factors all contribute to the development and worsening of mental health conditions. This global crisis significantly affects individuals and communities, impacting social interactions, work productivity, and overall quality of life. The World Health Organization (WHO) notes that mental disorders, particularly depression and anxiety, make up a large portion of the global disease burden. These diverse factors highlight the complexity of addressing mental health issues effectively.

**Purpose of Research:** This research highlights the global impact of mental illness on individuals and communities, emphasizing the urgent need for effective policy solutions. By examining the prevalence and contributing societal factors of mental health issues, the study advocates for comprehensive policies that prioritize accessibility and support for those affected.

**Methods:** This research paper combines quantitative and qualitative methods to evaluate the global burden of mental illness. It identifies key stakeholders and evidence-based solutions for addressing this public health issue. Using data from the World Health Organization (WHO), the Global Burden of Disease study, and peer-reviewed literature, the study offers a comprehensive analysis of the problem and its implications.

**Findings & Conclusions:** Findings indicate that improving mental health systems and expanding access to care can enhance mental health outcomes, but these efforts require significant financial resources and long-term commitment from policymakers. Raising mental health awareness and reducing stigma are vital for normalizing discussions about mental illness. To address systemic barriers, we need comprehensive, evidence-based interventions involving various stakeholders. Additionally, international collaboration is essential for sharing resources and knowledge. Despite challenges from different cultural and political contexts, such cooperation is crucial for making mental health support effective and accessible worldwide.

**Implications:** Neglecting mental illness on a global scale has serious implications that warrant urgent action. It is a major public health challenge, with financial burdens projected to reach \$6 trillion by 2030, reflecting its deep impact on individuals and society. In low- and middle-income countries, limited access to effective treatment exacerbates the situation, creating significant barriers that worsen conditions and perpetuate cycles of poverty and poor health outcomes. Addressing these disparities is crucial for both individual well-being and healthcare systems. Immediate interventions are needed to address this pressing crisis.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Enhancing Gun Safety Education and Discharge Protocols in Emergency Departments: Addressing Gaps and Promoting Health Workforce Equity

**Background:** Gun violence disproportionately impacts marginalized communities, particularly Black and Latinx populations in Washington, D.C. As critical access points for trauma care, emergency departments (EDs) are uniquely positioned to address public health inequities through structured discharge education. However, existing protocols are inconsistent and often fail to address the specific needs of at-risk populations, leaving a significant gap in preventive care.

**Purpose:** This literature review aims to evaluate existing discharge education practices in ED settings and propose evidence-based strategies to enhance gun safety education for vulnerable populations. By developing standardized, community-driven protocols, EDs can improve patient outcomes and reduce firearm-related injuries among marginalized groups.

**Methods:** A comprehensive review of current literature and data on gun safety education was conducted, focusing on interventions within ED settings. Frameworks such as the Health Belief Model (HBM) and Counseling on Access to Lethal Means (CALM) were examined for their potential to address perceived risks and barriers. Additionally, successful interventions from other healthcare settings were analyzed to identify best practices.

**Preliminary Findings and Conclusions:** Findings indicate that current gun safety discharge education in EDs is insufficient, especially for marginalized communities. Successful interventions often include structured protocols with safety checklists, visual aids, and bilingual materials. Leveraging Violence Intervention Specialists (VIPs) as community liaisons and incorporating gun safety education into discharge paperwork can increase adherence and improve patient outcomes. Implementing these practices at GWU Hospital has the potential to address existing gaps and reduce firearm-related injuries, particularly among underserved populations.

**Implications:** Integrating structured gun safety education into ED discharge protocols is a critical step toward promoting health workforce equity. By prioritizing culturally sensitive and accessible education, healthcare providers can address disparities in firearm injury prevention and support the long-term well-being of at-risk communities. Future research should focus on evaluating the impact of these interventions on patient adherence and community safety.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Addressing Postpartum Social Determinants of Health in Maryland and Washington, D.C.

**Background & Significance:** The postpartum period is critical for maternal and infant health, marked by significant physical, mental, and emotional changes. However, up to 40% of U.S. mothers do not attend postpartum follow-up visits, particularly those in underserved populations. Federally Qualified Health Centers (FQHCs), such as Clinic X, a multicenter clinic in Maryland and Washington D.C., address these challenges by offering social determinants of health (SDoH) screeners, such as the PRAPARE tool, to identify and mitigate barriers to care.

This study analyzed the relationship between SDoH and postpartum follow-up rates among patients at Clinic X, using the PRAPARE screening tool to assess barriers and enhance care continuity for vulnerable populations. The use of these tools in outpatient practice can offer insight into structural or systemic disparities that may hinder postpartum participation.

**Methods:** A retrospective observational study was conducted using data from 1,263 pregnancies in 2023. Blinded patient demographics, postpartum follow-up rates, and responses to a 13-item modified “PRAPARE” SDoH screener were analyzed. Chi-square and logistic regressions were performed to identify significant predictors of SDoH and postpartum visit completion rates.

**Findings & Conclusions:** Of the 1,263 pregnancies, 1,229 (97.3%) had postpartum follow-up appointments. The majority identified as Hispanic or Latino ethnicity, had less than a high school education, and were unemployed. Among 396 patients who completed the modified SDoH screener, 390 (98.5%) attended follow-up appointments. Notably, state of residence was significantly associated with non-completion of the SDoH screener ( $p=0.013$ ). However, logistic regression of all other screener responses showed no statistical significance between SDoH and postpartum follow-up attendance.

**Impact:** Extremely high postpartum follow-up rates at Clinic X highlight effective care delivery despite socio-demographic challenges. The literature strongly supports that Hispanic and Latino ethnicity, low levels of education, and unemployment are associated with adverse pregnancy outcomes. The lack of statistical significance between SDoH responses and follow-up suggests the screener may be more impactful at the individual clinician-patient level than as a predictor of group behaviors. SDoH screeners remain valuable for identifying and addressing individual risks. Repeated SDoH assessments during gestation and risk-scoring models could strengthen care delivery for underserved populations. Future research should focus on larger cohorts and improving SDoH screener completion rates.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Antiracism in medical education: Utilizing an integrated framework for tailored trainings

**Background & Significance of the Study:** Despite federal bans on diversity, equity, and inclusion efforts, some academic medical institutions have remained committed to centering equity and justice. More than ever, the healthcare workforce must be adequately prepared to address challenges to racial and health equity. Given varying capacities for antiracism, trainings must be tailored to address the nuances of institutional needs and workplace cultures.

**The Purpose of Your Research:** This study aimed to develop a framework and use it to create tailored antiracism trainings for two programs at GW SMHS. The framework offers a structured approach to identifying and addressing health disparities and systemic racism within clinical practice.

**Methods:** To frame the trainings, the Model of Antiracist Transformation was integrated with the National Institute on Minority Health and Health Disparities (NIMHD) Model for Health Disparities. The NIMHD Model organizes health disparities into five domains at four levels. The Model for Antiracist Transformation outlines three levels of antiracist capacity and iterative steps for action. The Expanded Model for Antiracist Transformation adopts tenets of the NIMHD Model at the individual and societal levels, allowing trainees to contextualize the domains in clinical practice.

**(Preliminary) Findings & Conclusions:** Two-hour training sessions were designed and tailored to each program's level of readiness to engage in antiracism. These sessions incorporate interactive group activities and guided reflections. For every level of readiness, a teaching case was developed to illustrate the integrated framework in a range of settings. Facilitator notes were developed to support consistent delivery across all trainers. To evaluate training effectiveness, a retrospective pre-post survey will be administered, where the trainees will measure their learning outcomes. Finally, the trainings' text and visual content were designed to meet accessibility standards.

**Revisiting the Significance of the Research:** The tailored antiracism training sessions provide a foundation for dismantling systemic racism in health education by addressing program-specific needs. By equipping faculty and students with tools for sustained antiracist learning, academic medical institutions can foster inclusive workplace cultures in healthcare, ultimately advancing health equity. To achieve lasting institutional change, we recommend conducting a needs assessment to ensure that trainings meet knowledge and capacity gaps. We also recommend that train-the-trainer modules are implemented to encourage buy-in to antiracism curriculum. This cyclical approach ensures that antiracism education remains responsive and effective in driving long-term transformation within institutions.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### The COAT Model: Reducing Plastic Waste in Academic Clinical Research Sites

#### Background & Significance:

Medical waste, particularly plastic waste, poses a significant environmental and health risk, with clinical research sites contributing to this issue. Excess supplies, often due to inaccurate expiration dates on research test kits, lead to unnecessary waste. The COAT model (Collect, Organize, Assess/Arrange, Transfer) was developed to optimize medical supply inventory at clinical research sites and reduce plastic waste by redistributing unexpired supplies to local Federally Qualified Health Centers (FQHCs) and free clinics.

#### Purpose:

This study aims to develop a sustainable strategy for reducing medical waste in clinical research through redistribution of excess supplies. Objectives include: to implement and evaluate the COAT model in optimizing medical supply inventory and minimizing plastic waste.

#### Methods:

The COAT model was implemented in two clinical research departments affiliated with an academic outpatient practice over six months. The process involved four steps: (1) Collect – identifying unexpired supplies from "expiring" or "expired" research test kits, (2) Organize – categorizing and inventorying the materials, (3) Assess/Arrange – coordinating with recipient clinics to determine supply needs, and (4) Transfer – delivering supplies to designated clinics. Waste reduction efficiency and cost savings were measured.

#### Findings & Conclusions:

During the implementation period, the COAT model successfully redirected over 100 pounds of plastic waste and provided an estimated cost savings of \$2,176 to recipient clinics. The waste reduction efficiency averaged 57%, meaning that more than half of the potentially discarded supplies were repurposed. The model was particularly effective in reallocating commonly used phlebotomy supplies, such as tourniquets, serum tubes, and needles.

#### Implications:

The COAT model presents a practical, cost-effective, and adaptable solution for reducing medical waste in clinical research while supporting resource-limited clinics. Its integration into academic research settings demonstrates the potential for widespread adoption. However, while the model effectively repurposes excess supplies, it does not address the root causes of waste, such as inaccurate expiration labeling and inefficient supply forecasting. Future research should explore upstream solutions, including improved inventory management and sponsor-driven policy changes to prevent unnecessary waste at its source. By refining and scaling strategies like the COAT model, clinical research can move toward greater sustainability without compromising quality or compliance.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### School-Based Pediatric Telehealth Quality Improvement Study

#### Background & Significance:

This project aims to improve the number of patients seen via school telehealth visits through a pilot program. Pediatric asthma remains a leading cause of emergency department (ED) visits and school absences, particularly among children in underserved communities. Pediatric patients from Wards 7 and 8 are 10 times more likely to be hospitalized for asthma than those residing in the NW quadrant. Geospatial analysis has shown that decreased educational attainment is associated with increased ED visit at-risk rates. Educational attainment plays an important role as a social determinant of health (SDOH) by shaping opportunities for employment (and therefore insurance status) and income. While the IMPACT DC intervention has been shown to reduce ED visits, school-based telehealth services remain underutilized. Using a quality improvement (QI) approach, this study seeks to increase uptake of school telehealth visits among students with asthma at participating schools.

#### Purpose:

To enhance the utilization and impact of school-based telehealth visits for children with asthma. The research aims to identify barriers to telehealth adoption and implement targeted interventions to improve engagement, ultimately leading to better asthma management and reduced ED visits.

#### Methods:

Parents of the children which utilized the school-based telehealth services with their child completed a questionnaire based on the 2011 validated questionnaire, "Telemedicine for Pediatric Primary Care: Satisfaction Survey," to evaluate the quality of the novel intervention. Additional questions were added to assess urgent care, outpatient physician usage, and ED visit rates before and 60 days after intervention implementation.

#### Findings & Conclusions:

As of current, 10 families have used the telehealth pilot project. The survey has been sent out to previous participants and will be sent out to future participants through April 2025.

#### Implications:

If successful, this pilot program could serve as a model for expanding telehealth services to manage other chronic pediatric conditions. The study highlights the potential of school-based telehealth in reducing health disparities and improving asthma outcomes in children. Future directions include refining interventions based on study outcomes and exploring future policy changes for sustainable telehealth integration.

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## GWSPH RESEARCH SHOWCASE

# PUBLIC HEALTH

### **Mice with Loeys-Dietz Syndrome (a connective tissue disorder) have altered gut microbial communities and BGC abundances**

Loeys-Dietz Syndrome (LDS) is a connective tissue disorder resulting from an inherited genetic mutation which arrests the function of the transforming growth factor- $\beta$  receptor (TGF- $\beta$ R) gene. In addition to its known role in connective tissues, TGF- $\beta$ R is also involved in immune regulation. Previous studies have linked mutations within TGF- $\beta$ R to the development of allergies which are more prevalent in LDS patients. Allergies, such as food allergies, are biologically complex, and increasing evidence has shown that the microbiome also plays an impactful role in their development and severity. The present project focuses on revealing the as yet uncharacterized microbial community composition that results in the presence of the TGF- $\beta$ R mutation.

We targeted the gut microbiome of 78 mice (37 healthy; 41 LDS), performing whole shotgun metagenomics on fecal samples to examine microbial communities and biosynthetic gene clusters (BGCs) which may play a role in the development of TGF- $\beta$ R mutation associated food allergies seen in LDS patients. Diversity analysis showed that LDS does not have an effect on the alpha diversity of the gut microbiome; however, beta diversity showed that LDS gut microbial communities are different. Beta diversity results are supported by differential abundance analysis, wherein we identified 100 microbial species that varied in abundance between LDS and healthy mice. Differential abundance analysis also showed varied abundances of 16 BGCs, one of which is associated with the production of monensin – a metabolite known for its role in immune regulation of eosinophils and mast cells—and was found to be at decreased abundance in LDS mice potentially contributing to allergies.

We show that mutations in TGF- $\beta$ R lead to shifts in the microbial community of the gut and suggests an altered metabolite profile which may contribute to the development of food allergies within LDS patients. We have provided the groundwork which will allow future studies to look more closely at the mechanisms linking TGF- $\beta$ R, gut microbiota, metabolites, and allergies with potential future impacts for both LDS patients and broader allergy research.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Effects of a Women's Health Workshop on Knowledge and Comfortability Discussing Sexual Health Topics

**Background:** Sexual health education plays a vital role in promoting overall well-being, yet in the US it lacks standardization. Traditional sex education focuses primarily on topics like sexually transmitted infections (STIs) and pregnancy prevention, often neglecting essential aspects of sexual health, such as menstruation, and sexual pleasure. This inconsistency in curricula across schools contributes to significant gaps in students' knowledge, leaving many young people ill-prepared to navigate their sexual health. This research aims to answer how a 2-hour workshop designed to teach GWU undergraduate women about sexual health influences their knowledge and level of comfort talking about this topic.

**Methods:** Participants were recruited through convenience sampling through the Women's Leadership Program (WLP) newsletter. Sixteen cisgender female students in the WLP program attended the workshop and answered the REDCap-based pre and post questionnaires, which were designed to measure changes in knowledge of certain sexual health topics (e.g., Anatomy, sexual pleasure, menstruation etc.) and changes in comfortability talking about sexual health with different people (e.g., female family members, male friends, sexual partner, etc.).

**Results:** All participants recalled learning about sexual health in school, while only 75% recall learning about menstrual health in school. Though family was the least common source for sexual health education, it was the most common source of information for menstrual health. In the pre-workshop questionnaire, the topic with the least reported knowledge, glans and gspot, had the highest average reported post-workshop change. STIs, had the highest pre-workshop percentage, and experienced the least average post workshop change. Additionally, participants seem to utilize friends and the internet to obtain information on topics not covered in their families or school. After the workshop, comfort levels talking to male friends about sexual health, showed a significant decrease, and sexual partner showed a nonsignificant decrease. Comfort levels with the remaining five categories of people increased significantly.

**Conclusion:** The increases in perceived knowledge and comfortability discussing sexual health in different settings highlight the effectiveness of the comprehensive and female oriented sexual health education provided in the workshop. An unexpected finding, however, was the decrease in comfortability discussing sexual health with a male friend and a sexual partner (although not a significant decrease for the latter). A potential explanation for this finding is that the increase in knowledge participants had post-workshop provided them with a wider understanding of sexual health, making them less comfortable discussing certain topics with male friends or sexual partners.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Storytelling as a catalyst: Teaching cases bridging antiracism theory and clinical practice

#### Background & Significance of the Study

Amidst the nationwide rollback of diversity initiatives, some medical education institutions are strengthening their commitment to equity by adopting antiracism training. Teaching cases are an effective storytelling method that helps professionals apply learnings to real-world scenarios, preparing them to identify and address racism at school and work.

#### The Purpose of Research

Student-authored teaching cases were designed to equip learners with tools to be antiracist within a healthcare system that upholds inequity.

#### Methods

To frame the teaching cases, the Model for Antiracist Transformation was integrated with the National Institute on Minority Health and Health Disparities' Model for Health Disparities. Students relied on one of three levels of capacity for antiracism – entering (beginner), emerging (intermediate), or evolving (advanced) – for clinicians, researchers, or academics. Drawing on their pre-medicine and allied health experiences, students developed real-world scenarios. Each teaching case was designed to help learners identify various forms of racism at the societal and individual levels of influence.

#### (Preliminary) Findings & Conclusions

Three student-authored teaching cases were developed with discussion questions, an answer key, and facilitator notes. Answer keys identify sections tied to dismantling whiteness, planning for collaborative change, and living out the social mission. Uniquely, these teaching cases were designed to be analyzed using the combined framework, allowing learners to simultaneously evaluate their own cyclical journey towards antiracism.

#### Revisiting the Significance of the Research

Integrating teaching cases into training programs helps bridge the gap between theory and practice, fostering confidence and competence in confronting racism. These teaching cases will be published in a health equity textbook later this year.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Advancing Diversity and Inclusion in Cancer Clinical Trials: Barriers, Necessity, and Strategies

**Background:** Cancer clinical trials have historically suffered from underrepresentation and lack of diversity, perpetuated by adverse social determinants of health and ingrained belief systems. Race-based medicine and color blindness lead to treatments that are often inappropriate and inaccurate for minoritized patients, overlooking the complexity of social and environmental factors. Implicit bias exists among research and clinical professionals and can result in denying clinical trial participation.

**Purpose:** This review examines the prevalence of racial inequities in clinical settings in the United States, linking these realities to the widespread lack of diversity in cancer clinical trials and the perpetuation of health disparities for these groups. It stresses the necessity of representative groups in cancer clinical trials for equitable medical advances.

**Methods:** A Boolean search methodology was employed using keywords to conduct a thematic analysis of 22 peer-reviewed articles in the NIH PubMed and ScienceDirect Databases (2010-2024) and two FDA policies to both understand racial inequities and examine current interventions and their effectiveness in promoting racial equity and community-based development within the oncology clinical trial space.

**Results:** This review produced streamlined recommendations corresponding to systemic barriers for a complete overview of how each sector should collaborate for future policy and guidance needs. These recommendations address improvements to FDA guidelines, data collection, financial barriers, community engagement, and workforce diversity. To move forward, the clinical workforce must dismantle biased belief systems and incorporate community-level discourse to holistically address social determinants of health and racial inequities in cancer clinical trials.

**Conclusion:** Though there has been a large amount of research working to understand these inequities, it must be translated into targeted, sustainable interventions and policy developments through the collaboration of governmental organizations, patient advocacy groups, communities, and other key stakeholders.

**Public Health Implications:** Addressing racial inequities in clinical trials will enhance data validity and improve patient outcomes, decreasing disparities between the overall health and survivorship of cancer patients of differing circumstances.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Using the Homeless Management Information System to Examine Screening for Homelessness at an Urban Academic Hospital

**Background:** People experiencing homelessness (PEH) frequently rely on hospitals for care, yet studies show most hospitals lack systematic screening for housing status and many PEH are not identified or documented as homeless at the hospital. This lack of screening may lead to a missed opportunity for tailored discharge planning and connections to community resources. This study aimed to assess how reliably an urban academic hospital identifies PEH in both ED and inpatient settings by comparing electronic health records (EHR) with the local Homeless Management Information System (HMIS).

**Methods:** HMIS data was obtained for 10,000 adults  $\geq 18$  years categorized as “literally homeless” according to HUD criteria who were within or have been placed into the HMIS data system during a 6-month period from September 1, 2019 to February 29, 2020. Full names, dates of birth, and gender were searched at George Washington University Hospital EHR for complete matches only. Inclusion criteria were having had at least 1 ED visit or inpatient admission during the same 6-month time period. Trained reviewers systematically examined HMIS-matched patient charts per encounter for clear documentation of homelessness (ie., descriptors such as homeless, undomiciled, from shelter or street, unstable/lacking/insecure housing, stays with friend/family). Up to a single ED visit without admission and a single admission per matched patient were recorded.

**Results:** Out of 9,839 HMIS entries searched, 4,893 had EHR charts and 1,145 met inclusion criteria. Of 1,145 HMIS-matched patients, 63.6% were missed (ie., not documented as experiencing homelessness in the EHR) in ED visits, whereas 39.2% were missed during inpatient admissions ( $p < 0.0001$  by Chi-square). Multivariable logistic regression revealed that among ED visits, Non-Hispanic Black patients (OR = 1.55, 95% CI: 1.04–2.30) and adults with family (OR = 2.68, 95% CI: 1.31–6.12) were at higher risk for being missed (ie., OR > 1), whereas psychiatric diagnoses were associated with homeless status not being missed in the ED (OR = 0.16, 95% CI: 0.09–0.26) or admissions (OR = 0.24, 95% CI: 0.10–0.59). For admissions, surgery or trauma diagnoses were a risk factor for being missed (OR = 2.50, 95% CI: 1.09–5.90).

**Conclusion:** These findings highlight gaps in current screening processes and underscore the need for standardized screening for housing status, especially in ED settings and among surgical or trauma admissions. We demonstrate that using community data resources like HMIS can help inform interventions to reduce health disparities in vulnerable populations.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Measuring Health Equity Knowledge Among MD Students in a Clinical Public Health Track

**Background:** To reach Healthy People 2030 goals, medical education must equip MD students to recognize and address health disparities. Yet, no standardized definition of health equity or measure of trainee capacity currently exists. To fill this gap, the Student Health Equity Survey (SHES) was developed and administered as a baseline study of students' knowledge, attitudes, and capacity to advance health equity.

**Methods:** The SHES is an anonymous online survey designed to assess health equity competencies. The survey included 36 Likert scale items across six domains of public health. Responses from two incoming cohorts of MD students (n=137) enrolled in a clinical public health track were collected in Summer 2022 and in Fall 2024.

**Results:** While MD students understand foundational concepts such as the impact of food (98.54%), neighborhood (98.54%), and insurance (96.35%) on health, the majority still hold misconceptions on the scope of systemic factors resulting in health disparities. Only 16.79% of respondents correctly defined health equity, and only 27.74% recognized that eliminating individual behaviors alone does not reduce health disparities, suggesting an overemphasis on personal responsibility rather than structural determinants.

**Conclusion:** Findings indicate that opportunities exist to expand and reiterate in the public health curriculum the systemic factors that drive health disparities, as well as to deepen students' understanding of health equity beyond its association with only racially minoritized populations. Targeted recommendations have been presented to the MD program to validate the strengths of the curriculum but also offer key areas for reform.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### A silent epidemic: Metabolic dysfunction-associated steatotic liver disease (MASLD) in the United States among Hispanic Latinx children

**Background:** Nonalcoholic fatty liver disease (NAFLD) or now called Metabolic dysfunction-associated steatotic liver disease (MASLD) is a condition characterized by the accumulation of fat in the liver. This disease represents a hepatic manifestation of metabolic syndrome, with its rising prevalence paralleling the increasing incidence of obesity and diabetes. The prevalence of MASLD, has notably increased among pediatric populations in the United States, with approximately 10% of children affected, making it the most common chronic liver disease in children and adolescents. The prevalence of MASLD varies among ethnic/ racial groups, with the Latin American population being affected disproportionately.

**Methods:** The methods involved reviewing research papers and studies that examine the prevalence of MASLD in pediatric populations, analyzing the risk factors, and current interventions and treatments. The research on the etiology of MASLD in children will lead to a series of policy recommendations aimed at enhancing the identification and treatment of MASLD.

**Results:** The most important risk factors for developing MASLD are obesity, metabolic syndrome and insulin resistance. The liver is the only organ in the body capable of metabolizing fructose in substantial quantities. Preliminary clinical research suggests that reducing the intake of sugary beverages, foods and the total fructose consumption, particularly from added sugars, may significantly contribute to the reduction of hepatic fat accumulation. Food insecurity and low-income households serve as major barriers for Hispanic children, limiting access to nutritious foods and preventing the adoption of beneficial dietary practices.

**Conclusion:** The pathogenesis of MASLD is multifactorial and not entirely understood due to the interplay of genetic and environmental factors that contribute to its development. Due to the absence of approved pharmaceutical treatments for children and the challenges associated with reversing MASLD once established, early onset of the disease can predispose Hispanic children to a lifetime risk of metabolic disorders and other metabolic health conditions and decreasing their life expectancy. The risk of liver disease among the Hispanic pediatric population can be reduced by implementing public health interventions that promote healthier dietary choices and increased physical activity combined with the development of early detection guidelines tailored to children.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Differences in the knowledge and attitudes toward the Human papillomavirus vaccine between GWSPH and other GW undergraduate students

**Background:** Human papillomavirus (HPV) is the most common viral sexually transmitted infection in the United States. Individual health beliefs, understanding of disease, and perceived susceptibility influence vaccine decision-making. Undergraduate students at the George Washington University (GW) select majors and fields of study based on interests and career aspirations, exposing students to different classes and topics. As an undergraduate class that were some of the first to have had access to the HPV vaccine at the recommended age, this research aims to identify how these college age students view the HPV vaccine and its significance depending on their declared school of study.

**Methods:** Data was collected through a series of survey questions adapted from the Carolina HPV Immunization Attitudes and Beliefs Scale (CHIAS) about perceived knowledge and attitudes towards the HPV vaccine. Using convenience and snowball sampling, 26 participants from 4 of the 7 GW undergraduate schools. Survey responses were analyzed for similarity of responses and trends across subgroups.

**Results:** Initial results reveal higher levels of agreement with statements of understanding the purpose of the HPV vaccine, hearing about the HPV vaccine, and risk of contracting HPV from students in the Milken SPH compared to any other GW undergraduate school. Students who strongly agreed with statements on hearing about the HPV vaccine from professors, in school, or from colleagues were exclusively from the GWSPH. When asked what words came to mind when thinking about the HPV vaccine, the most common words used included prevention, sexually transmitted infections, cancer, and multiple doses.

**Conclusion:** The survey findings indicate a difference in understanding and perceived knowledge of the HPV vaccine based on learned information and sources of education. Students studying public health, science, or premedical majors were more confident in their understanding of the vaccine's function and its efficacy in preventing disease, suggesting an educational influence on health beliefs surrounding the HPV vaccine.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### The Impact of Housing Instability on Mental and Physical Health Among Low-Income Populations

**Background:** Housing instability characterized by frequent moves, overcrowding, and the risk of eviction is an increasing public health concern. It disproportionately affects low-income populations and contributes to poor mental and physical health outcomes. This study primarily explores how structural barriers such as housing affordability and discriminatory zoning policies impact individual health. Additionally, it seeks to examine expert perspectives on effective interventions.

**Methods:** This study employed a mixed-methods design. The quantitative component analyzed extensive secondary data from the U.S. Department of Housing and Urban Development (HUD) and public health surveillance systems. The qualitative portion includes semi-structured interviews with housing policy experts and public health practitioners. The transcripts from these interviews were thematically coded to identify recurring themes related to specific health disparities and uncover service gaps and structural determinants.

**Results:** Research is ongoing, results will be presented during SPH research day.

**Conclusion:** This study is expected to highlight the critical role which housing plays in shaping population health. These findings will reinforce the importance of dealing with housing instability as a social determinant of health through coordinated public health, policy, and social service efforts. The results support the need for structural reforms and increased investment in affordable housing to reduce health disparities.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Unraveling Menstrual Stigma: A Transnational Dialogue

**Background:** The menstrual cycle is a biological process that occurs in over 1.8 billion people worldwide. However, very few of these girls, women, transgender men, and non-binary persons know how to properly manage their menstrual cycle in a dignified manner (UNICEF). Despite its normality, menstruation is often surrounded by myths, taboos, stigmas, and shyness, not only in the Global South but also in Western countries. Many 21st-century menstrual movements in the U.S. focus on issues such as policy reforms and gender equality, advocating for accessible menstrual products. While these topics are important, the discussions often view the experiences of menstruators in the Global South as extreme and stigmatized. The Western ideation that the Global North should inform public health interventions and policy reforms in the Global South not only undermines the grassroots advocacy led by local leaders in those communities but also overlooks the fact that menstrual stigma manifests in various forms across cultures—including in Western societies. Transnational feminism challenges ‘global sisterhood’ by making a point that non-Western cultures and lived experiences of women in the Global South are oftentimes ignored. Using transnational feminism as a framework to understand the nuanced and unique experiences of menstruation globally has the capability of shaping community-driven public health initiatives.

**Purpose:** This qualitative study included semi-structured Key Informant Interviews to investigate participants’ personal or observed behaviors, encounters, and perceptions surrounding menstruation. Data collected will be used to analyze similarities and differences between perceived behavior amongst each population.

**Methods:** This qualitative study was conducted amongst participants residing in the DMV, affiliated with a cultural background in either the Global North or Global South and identifies as a non-menstruators or menstruator. Using the Health Belief Model, interview questions explored perceived barriers, behaviors, encounters, and actions surrounding menstruation. The interviews seek to analyze the similarities and differences in how individuals affiliated with the Global North and Global South perceive menstruation. The study aims to retrieve and analyze 15-20 interviews from a diverse pool of participants to better inform future public health interventions regarding menstrual health. Using the qualitative analysis tool Nvivo, interviews were transcribed to collect similar themes amongst participants’ responses.

**Preliminary Findings:** Initial interviews reveal patterns in how menstrual health education is experienced across cultural contexts. Participants affiliated with the Global North report receiving formal menstrual health education but note that it primarily focuses on the biological aspects of menstruation and lacks discourse on its social and cultural implications. Many learn about menstruation through media or personal conversations. Participants affiliated with the Global South also report receiving menstrual health education but describe it as incomplete. Many emphasize a lack of open dialogue about menstruation in their families, often referring to silence around the topic.

**Conclusion:** Early findings suggest both overlap and divergence in how menstruation is taught, experienced, and perceived across global contexts. As more interviews are conducted, emerging patterns are explored to better inform public health interventions.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### Structural Barriers Faced by Women-Led Organizations in Nepal to Accessing Resources

**Background:** Women-led organizations (WLOs) are integral to the Nepali community, responding to issues ranging from violence against women to disaster response and different issues related with public health. WLOs not only provide critical support and response services, they are also the pillars of community movement building and social transformation as they fight against social injustice and human rights violation. WLOs in Nepal have also contributed a lot for political and legal awareness building among women contributing to women's civil and political rights. Despite their significant contributions, these organizations face systemic barriers to accessing financial, technical, and human resources due to structural inequities, intersectional challenges, and limited institutional investment.

**Objective:** This research aimed to identify the key barriers WLOs face in accessing resources and proposed actionable recommendations for stakeholders to support and strengthen their operations.

**Methods:** A survey of 30 randomly selected WLOs across WOREC working districts in Nepal was conducted between May and July 2024. Data were collected through in-person interviews and Google form questionnaires facilitated by WOREC district coordinators. Questions addressed organizational details, resource gaps, and access challenges. Quantitative and qualitative data were analyzed to identify trends and insights.

**Results:** Findings & Conclusions: The survey revealed that 94% of WLOs lack essential infrastructure, with over 80% reliant on unpaid volunteers. Financial challenges include limited access to funding opportunities, complex application processes, and inadequate proposal-writing skills. Geographic isolation, language barriers, and technical resource gaps further hinder operational effectiveness. Despite these challenges, WLOs demonstrate remarkable grassroots advocacy, community engagement, and survivor leadership.

**Implications:** Addressing these barriers requires systemic reforms, including simplifying funding processes, investing in capacity-building programs, and fostering strategic alliances among WLOs. Equitable resource allocation and recognition of grassroots expertise are essential for ensuring these organizations can sustain their vital roles in advancing gender equality and community transformation. This study underscores the urgency of supporting WLOs to bridge systemic gaps and promote inclusive development in Nepal.

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# GWSPH RESEARCH SHOWCASE

## PUBLIC HEALTH

### The Impact of Shift Work on Academic Performance Among EMS Professionals: Challenges and Interventions

**Background:** Despite research on the cognitive decline of those working in shift work, the effects on academic performance have largely been underexplored for student workers in healthcare occupations. EMTs and ER Techs, specifically those that are pursuing a higher education, must balance the demanding work schedule alongside academic responsibilities. This often requires shift work and extended hours that are associated with disrupted sleep patterns, cognitive fatigue, and poor concentration. This all can hinder learning and academic achievements. Understanding the intersection of fatigue and academic performance is especially important to address barriers to educational achievement within this workforce.

**Methods:** This study is a mixed-methods survey. There will be a mixture of closed-ended questions, rating scales, and yes/no questions. Additionally, there will be open-ended sections for the participant to elaborate. This study will primarily focus on undergraduate students working within the sphere of Emergency Medical Services and shift work. However, to further this research, there will be the inclusion of students that work and those that do not work. The only exclusionary material are students working outside the D.M.V. and students currently working on a doctoral degree. Students receiving a master's and/or between the ages of 25-30 will be invited to complete the survey, however they are not the main study population. Data collection will be done through REDCap. The primary outcome is to figure out whether there is a clear difference in student responses when it comes to academic scores and perceived academic abilities. The secondary outcome is to see what students sleep schedules are like. Due to this being a mixed-method survey, the quantitative research will be done through descriptive statistics, and the qualitative data will be done through a rapid thematic analysis. This study's modified IRB was approved by the ethics review board.

**Results:** Research is ongoing, and complete findings will be available by the time of research day.

**Conclusion:** Results of this study will help supervisors of EMS professions to identify ways to support their staff who are still in school. Additionally, these results may help EMS workers identify patterns of behavior that can help them improve their study habits.

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At the Office of Research Excellence, we hold in the highest regard the insight, encouragement, and commitment our students receive from their mentors. Their tireless dedication and meaningful support are instrumental in shaping the next generation of scholars and professionals. Through this shared commitment, we aim to foster a community where curiosity is nurtured, talents are developed, and future leaders are empowered to thrive.

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