The Alliance
Hispanic Alliance for Clinical & Translational Research

14th Scientific Day
May 7

Advances in Health through Implementation Science: Research in Real-World Practice and Community Settings

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ABSTRACT SUPPLEMENT

Editorial

From Evidence to Impact: Implementation Science Translates Real-World Research into Better Health for All

Ensuring that evidence-based practices and interventions are not only developed but effectively integrated into routine health care, especially where they are needed most, is crucial (1, 2). While sharing the rigorous methodologies of clinical research, implementation science goes further by addressing critical contextual factors such as barriers, facilitators, and lived experiences that affect the uptake of evidence-based interventions (3, 4). The relevance of these complex interactions has become increasingly evident in recent years, especially as health systems face the persistent challenge of translating evidence-based interventions into meaningful, measurable outcomes in everyday practice (1).

Recognizing the critical gap between evidence and impact, the Hispanic Alliance for Clinical and Translational Research (The Alliance) has prioritized the integration of implementation science into its community engagement initiatives. This year, the Alliance's 14th Scientific Day addresses the above under the theme ***"Advances in Health through Implementation Science: Research in Real-World Practice and Community Settings"***. As in the previous years, the Scientific Day serves as a platform to disseminate research findings conducted in real-world contexts and to highlight flexible, culturally responsive strategies that incorporate diverse perspectives. It also fosters networking and new collaborations among investigators, healthcare providers, and key stakeholders beyond academia, further advancing the translation of research into better health outcomes for all.

This special supplement presents a collection of the scientific abstracts, selected by peer review, showcased at the 14th Scientific Day. Together, these abstracts reflect the strong and growing collaborations among academic institutions, community stakeholders, healthcare professionals, and policymakers, all working to advance clinical and translational research in Puerto Rico.

We extend our gratitude to the researchers and authors who dedicate their efforts to produce meaningful science to improve health outcomes. In addition, the Alliance recognizes the peer reviewers and collaborators whose dedication made this supplement possible. We hope that the research presented in this issue inspires continued engagement and a renewed sense of urgency in applying science where it matters most, in the lives of people and communities.

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References

1. National Cancer Institute. Implementation Science. https://cancercontrol.cancer.gov/is
2. University of Washington. What is implementation science? https://impsciuw.org/implementation-science/learn/implementation-science-overview/#:~:text=%F0%9F%92%BB%20National%20Institutes%20of%20Health
3. Cooper C, Watson K, Alvarado F, et al. Community Engagement in Implementation Science: the Impact of Community Engagement Activities in the DECIPHeR Alliance. Ethn Dis. 2024;DECIPHeR(Spec Issue):52-59. Published 2024 Apr 24. PMID: 38846725.
4. Bauer MS, Kirchner J. Implementation science: What is it and why should I care? Psychiatry Res. 2020 Jan;283:112376. PMID: 31036287.

Abstracts*

CHRONIC STRESS-INDUCED HIPPOCAMPAL CHANGES IN MURINE OVARIAN CANCER MODELS: A LINK TO DEPRESSIVE-LIKE BEHAVIORS

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INTRODUCTION: Patients with ovarian cancer (OC) frequently experience depression, which negatively affects their quality of life and prognosis. Our research indicates that chronic stress (CS) induces systemic inflammation, contributing to disease progression. Other studies have also highlighted its role in the development of depressive symptoms. Microglia are crucial in brain inflammation and produce brain-derived neurotrophic factor (BDNF), essential for neuronal health and relieving depression. However, the effects of CS and OC on depressive symptoms in OC patients are still not well understood. This study aims to explore whether CS and OC lead to changes in the hippocampus (HPC) that result in depressive-like behavior in mice with OC, hypothesizing that CS will increase microglial inflammation and diminish neuronal health HPC.

METHODS: We inoculated C57BL/6 mice with OC cells and subjected them to daily restraint stress for four weeks. After sacrifice, we processed their brains for immunofluorescence analysis of BDNF, IBA1, IL1β, and c-Fos.

RESULTS: Our data indicate that CS accelerated tumor growth, increased microglial infiltration (IBA1) and IL1β levels, while decreasing BDNF levels and neuronal activity in the HPC. In vitro experiments using stress hormones demonstrated upregulation of NFκB pathway-related proteins in microglia, underscoring the significant role of the central inflammatory pathway in microglial activation.

CONCLUSION: These findings support the BDNF hypothesis, which suggests that a decrease in BDNF levels in the HPC plays a direct role in the onset of depression. This study establishes a foundation for future research into how OC and CS can influence brain activity and behavior.

Funding: This study was supported by the National Institute of Health, Grant numbers U54CA163071, T32GM144896, and R01CA276224.

IACUC Approval: This study was reviewed by the Institutional Animal Care and Use Committee (IACUC) at Ponce Research Institute (PRI); approval number 2004000282.

SEX-SPECIFIC SYNAPTIC CHANGES IN THE POSTERIOR HYPOTHALAMIC NUCLEUS FOLLOWING ACUTE STRESS

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INTRODUCTION: Adaptation to stress triggers autonomic and neuroendocrine responses via brain regions such as the posterior hypothalamic nucleus (PH) and infralimbic cortex (IL). However, whether synaptic plasticity in the PH contributes to stress adaptation remains unclear. In this study, we examined whether restraint stress impacts synaptic transmission in the PH of adult male and female rats. We hypothesized that stress would alter excitatory activity in the PH if this structure contributes to stress adaptation.

METHODOLOGY: All animal procedures were approved by the IACUC (#2403143828). We injected a channelrhodopsin-expressing virus into the IL of adult rats for optogenetic stimulation of IL terminals in the PH. Additionally, animals were injected with a virus to label inhibitory neurons in the PH. Eight weeks after surgery, the animals were divided into non-stress and stress groups. Stress animals were restrained for 30 minutes. Afterward, rats were sacrificed, and we analyzed synaptic inputs to PH neurons using whole-cell patch-clamp recordings.

RESULTS: We observed a reduced decay time of spontaneous excitatory postsynaptic currents (sEPSCs) in stressed female rats. We also found increased sEPSC amplitude in stressed females compared to female controls and stressed males. This suggests that stress enhances synaptic transmission in the PH in a sex-specific manner. However, analysis of IL-PH synaptic transmission showed no effect of stress, suggesting that acute adaptation to stress does not involve plasticity in the IL-PH pathway.

CONCLUSION: These findings suggest that sex-specific circuits contribute to stress adaptation, with PH plasticity playing a role in stress adaptation in females.

Funding: This research was supported by: Fundación Intellectus [YRE], U54 MD007579 (B.R.A.I.N Core), PHSU RISE program NIGMS-NIH R25GM082406 [YRE]; PHSU G-RISE program NIGMS-NIH T32GM144896 [YRE]

IRB Approval: The study did not involve human participants or animal subjects and, therefore, was not subject to IRB approval.

EXPLORING-PYRUVATE-KINASE-RECRUITMENT-TO-THE-LYSOSOME -FOR -DEGRADATION

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INTRODUCTION: Chaperone-mediated autophagy (CMA) selectively degrades proteins such as Pyruvate Kinase M2 (PKM2), a key glycolytic rate-limiting enzyme, to regulate the energy-biomass balance. Heat shock protein 70 (HSP70) recognizes specific KFERQ-like motifs, allowing for degradation. This process results in the accumulation of intermediates that can be used to synthesize nucleic acids and other biomolecules while also facilitating tumorigenesis by producing conditions that weaken the immune system. The mechanism of how Hsp70 recruits PKM2 to the lysosome is unclear. We hypothesize that specific co-chaperones direct this selective process to facilitate the handoff to the chaperone Hsp70. Biotinylation and site-specific unnatural amino acid (UAA)-mediated photo crosslinking are being used to identify those missing proteins. Insight from these studies will further our understanding and its role in metabolic conditions, highlighting the therapeutic potential for CMA activators or inhibitors.

METHODS: Assembly and expression of PKM2 constructs and introduction of an amber stop codon into the target protein to incorporate UAA using engineered tRNAs. Once the recombinant PKM2 was obtained, photocrosslinking experiments awaited to capture/extract the co-chaperones using streptavidin resin.

RESULTS: Amber stop codons were introduced in all residues (394-397; yields 46%-54%), and residue 396 was solvent-accessible, suggesting high CMA activity.

CONCLUSION: Constructs for PKM2 were successfully made/expressed and purified by affinity chromatography. PKM2 acetylation reduces its enzymatic activity and enhances interactions with Hsp70. UAA incorporation efficiency was consistent across all modified sites. Substitutions into residue 396 on PKM2(K305Q) were selected for further testing, as models show the residue is solvent-accessible.

IRB Approval: The study did not involve human participants or animal subjects and, therefore, was not subject to IRB approval.

TBCK VARIANTS IN PUERTO RICO: GENOTYPIC AND PHENOTYPIC CHARACTERIZATION OF 23 AFFECTED INDIVIDUALS

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INTRODUCTION: TBCK-related encephaloneuronopathy (TBCKE) is a rare autosomal recessive disorder associated with hypotonia, developmental delay, focal epilepsy, and neuromuscular weakness. This study aims to characterize the genotypic and phenotypic presentation of individuals with TBCKE in Puerto Rico.

METHODS: We conducted a retrospective analysis of 23 individuals (14 females, 9 males, ages 6 months to 23 years) with TBCK variants, identified through epilepsy panels, neurodevelopmental gene panels, and exome sequencing. Clinical data were reviewed to assess the presence of neurological and systemic phenotypes. Approved by the IRB 2305114422A001.

RESULTS: The p.R126X variant was the most common, occurring in 91.3% of the individuals observed. Additionally, we identified: two individuals with an exon 23 deletion, two individuals carrying both p.Arg126Ter and p.Phe675Leufs*20. The phenotypic spectrum included congenital hypotonia, progressive motor impairment, epilepsy, and neuromuscular weakness. Affected individuals were distributed across various regional areas in Puerto Rico, with a predominant concentration in the Metro, Bayamón, Ponce and Caguas health regions.

CONCLUSION: This study represents the largest cohort of TBCKE cases in Puerto Rico, confirming p.R126X as the predominant variant while identifying additional pathogenic mutations. The Metro-North and Caguas regions appear to have a higher prevalence of affected individuals, suggesting a potential regional founder effect. Further research is needed to investigate genotype-phenotype correlations and explore potential therapeutic interventions.

Funding: Supported by U54 MD007600 (National Institute on Minority Health and Health Disparities) from the National Institutes of Health.

CD4+ T-CELL IMMUNE ENHANCEMENT INDUCED BY STAT SIGNALING: THE DUAL IMMUNOMODULATION ROLES OF NATURAL COMPOUNDS.

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INTRODUCTION: This study aims to compare the immunomodulatory properties of combined natural compounds Polysaccharide peptide (PSP) and Erinacines (ERI) on the adaptive immune system. Specifically, we aim to use Jurkat T-cells as our in-vitro model with or without combined treatment using ERI and PSP at dose-dependent concentrations. Immune markers such as: Protein Kinase R (PKR), Signal Transducer Activator of Transcription 1 and 2 (STAT1/2) Interferon gamma (IFNγ) and Nuclear factor kappa B (NFkB) are pivotal in CD4+ T-helper activation and antiviral response. PKR restricts HIV-1 entry through Cofilin phosphorylation and is activated downstream of IFNγ. STAT1 is critical for T-helper differentiation and STAT 2 is part of IFN type I that boosts this response. NFkB is activated by T-cell receptors which is crucial for Interleukin-2 production and T-cell defense against viruses. Having this said, we hypothesize that PSP and ERI leads to a significant CD4+ enhacement and activation.

METHODS: Cells were treated with both PSP and ERI during day 3 and 6. Immunoblots were performed for: PKR, IFNγ, STAT1/2, NFκB and Cofilin-1. MTT-viability assays were implemented to measure cytotoxicity.

RESULTS: Immunoblotting and RT-qPCR resulted in the overexpression of PKR, STAT1/2 and NFκB and downregulation of Cofilin-1. MTT reported no cytotoxicity during a 6-days treatment.

CONCLUSION: Both PSP and ERI show synergistic effects in Jurkat T-lymphocytes with an effective working concentration between 400µg-600µg. ERI shows a stronger response with a slightly less viability. Combined treatment can open the avenue to enhance adaptive immunity against pathogenic threats.

Funding: The project described was supported by the UCC Pilot Project Program grant (E.A.R.).

IRB Approval: IRB approval was not required for this study as it does not involve human subjects.

SCREENING OF LYOPROTECTANTS IN OPTIMAL DEVELOPMENT OF SOLID NANOSUSPENSION

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INTRODUCTION: Poor drug solubility challenges pharmaceutical development, leading to low bioavailability, need of high-dose administration and dose-dependent side effects. This study aimed to develop an optimal solid nanosuspension of a selective estrogen receptor modulator (SERM), benzothiophene-based bioactive (BPB-1) drug, to enhance its low oral bioavailability.

METHODS: BPB-1 (1%w/v) nanosuspensions were prepared using a top-down mechanical milling method employing non-ionic stabilizers. Liquid nanosuspensions were solidified via lyophilization using mannitol and trehalose as primary lyoprotectants, and PEG 20,000 and dextran as auxiliary polymer(s). Solid state characterization of optimal solid nanosuspension was performed using dynamic light scattering (DLS), scanning electron microscopy (SEM), differential scanning calorimetry (DSC), powder X-ray diffraction (PXRD), equilibrium solubility and dissolution studies.

RESULTS: The solid nanosuspension formulated with mannitol (20% w/v) and dextran (1% w/v) demonstrated superior performance compared to other formulations, as evidenced by its relatively smaller nanometer (nm) particle size (132.1 ± 1.0 nm) and low polydispersity index (PDI) (0.128 ± 0.02), without particle aggregation or sedimentation post-lyophilization. SEM images of the optimal solid nanosuspension demonstrated a layered, plate-like morphology, while DSC and PXRD analyses confirmed reduced BPB-1 crystallinity post-lyophilization. Solubility and dissolution studies revealed significant impact of media compositions on stability of solid nanosuspension, recommending the need to identify potential media-specific interactions.

CONCLUSION: The study highlights the crucial role of lyoprotectants in maintaining the integrity of solid nanosuspensions. Specifically, identifying an auxiliary long-chain polymer that, when combined with a primary lyoprotectant, could impart additional stabilization, contributing to excellent colloidal stability and redispersibility for enhanced BPB-1 delivery.

Funding: This research was supported by the Puerto Rico Science, Technology, and Research Trust's Catalyzer Research Grant (CRG) Award. Mariela Deliz Rueda acknowledges the funding from National Science Foundation Research Experiences for Undergraduates (NSF REU) – University of Puerto Rico - Molecular Aspects of Pharmaceutical Sciences (UPR-MAPS) Program at the School of Pharmacy, UPR Medical Sciences Campus Award Number: 2149902.

IRB Approval: This study did not involve human participants or animal subjects. Therefore, IRB/IACUC approval was not required as per the guidelines of the Medical Sciences Campus, University of Puerto Rico.

COMPARING SYSTEMIC LUPUS ERYTHEMATOSUS WITH A NORMAL IMMUNE RESPONSE THROUGH BIOOPTIMATIC METHODS

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INTRODUCTION: Systemic Lupus Erythematosus (SLE) is a chronic autoimmune disease. SLE is the most common form of Lupus worldwide and disproportionately affects women. A better understanding of how the adaptive and innate immune system operate in SLE is required to identify novel biomarkers and to create better therapeutics. This study's aim is to compare differentially expressed genes (DEGs) across different cells of the adaptive and innate immune system when contrasting SLE with a normal immune response. Although vaccinations do not induce the actual disease, the Yellow Fever vaccination's clinical and serological manifestations mimic a real viral infection and thus was used as a normal immune response model.

METHODS: A publicly available dataset from the Gene Expression Omnibus (GEO) was used for this study (GSE51997), which included 36 samples of Peripheral Blood Mononuclear Cell (PBMC) pulldowns for different immune cell markers: CD4+, CD16-, and CD16. The dataset was analyzed using BioOptimatics tools, including Multiple-Criteria-Analysis (MCO) for identifying DEGs, and Maximal Spanning Tree (MST) for eliciting a maximal correlation structure among the DEGs. Gene Ontology (GO) was used to investigate associated molecular functions, cellular components, and biological processes of the DEGs. These tools are part of our group's OBAMA R analysis suite and are available online in Open Access format.

RESULTS: Results show a list of common DEGs: *TMSB4X*, *B2M*, *EEF1A1*, *IFI44L*, and *ISG15*. Literature review shows that *TMSB4X* and *EEF1A1* represent novel biomarkers for SLE.

CONCLUSION: This study's future direction is to propose a novel dysregulated pathway that leads to SLE.

Funding: This work was supported by the National Institutes of Health grants R25DK113652 and R25GM127191.

IRB Approval: N/A, exempt.

ROLE OF HIV-1 GLYCOPROTEIN GP120 IN NEUROINFLAMMATORY RESPONSE AND NEURONAL DAMAGE

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INTRODUCTION: HIV-1 glycoprotein gp120 is a key contributor to HIV-1-related neurotoxicity, causing neuronal damage by inducing inflammatory and apoptotic responses. It interacts with chemokine receptors in nervous cells, triggering signaling cascades and releasing proinflammatory cytokines like IL-1β. The NLRP3 inflammasome processes IL-1β, leading to chronic inflammation and worsening neuronal damage. A significant aspect of gp120-induced neurotoxicity is its interaction with beta-amyloid, a protein linked to neurodegenerative diseases like Alzheimer's. Beta-amyloid accumulation amplifies neuroinflammation and worsens gp120-induced neuronal damage, accelerating neurodegeneration.

METHODS: This project aimed to evaluate factors that enhance cell survival in rat embryos, astrocytes, and neurons following in vitro treatment with gp120. We conducted primary cultures and cocultures of neurons and astrocytes, exposing them to gp120 to induce neuroinflammation. NeuN and MAP-2 antibodies were used to assess neuronal differentiation and the expression of mature neurons. We also assessed caspase activation and proinflammatory cytokine levels using Western blot.

RESULTS: Confocal microscopy provided insights into the structural effects of gp120 on cells, revealing alterations in MAP-2 and NeuN expression in hippocampal neurons and astrocytes, which affected neurite integrity. Western blot analysis confirmed changes in β-catenin, pAKT1, caspase-9, and ERK1/ERK2 expression in gp120-treated rat brain homogenates, indicating activation of apoptotic and inflammatory pathways.

CONCLUSION: Our approach aimed to demonstrate how gp120 induces neurotoxicity via inflammatory and apoptotic pathways, contributing to neuronal damage. By identifying factors that promote cell survival in the presence of gp120, we hope to uncover potential therapeutic strategies to mitigate neurological damage in HIV-1 patients.

IACUC Approval: Protocol #041-2023-34-00-PHA.

Acknowledgments: The content is the sole responsibility of the authors and does not necessarily reflect the official views of the Universidad Central del Caribe (UCC). This project was supported by the OADRGS, the Hispanic Alliance for Clinical and Translational Research (The Alliance) under Grant# U54 MD007587 from the National Institute on Minority Health and Health Disparities (NIMHD) of NIH, the Expanding Undergraduate Students Education, Opportunities, and Options in Clinical and Translational Research program supported by the US Department of Education Title V Grant Award #P031S200104, the MAC-FRED Program 2018 and Grant #SC3GM143983 from NIGMS.

SINGLE-NUCLEUS RNA SEQUENCING REVEALS THE IMMUNOLOGICAL MICROENVIRONMENT OF HPV+ AND HPV- PENILE CANCER

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INTRODUCTION: The morbidity and mortality rates of penile squamous cell carcinoma (PSCC) in Puerto Rico is significant, with HPV-associated cases accounting for 60% of cases. The study aims to characterize the immunological tumor microenvironment (TME) in penile cancer, which is crucial for disease progression, using single-nucleus RNA sequencing.

METHODS: Sequencing (Illumina HiSeq) of 3,000 nuclei from thirteen PSCC samples (8 HPV- and 5 HPV+) was performed using the 10X Chromium System (10X Genomics). Curated Cancer Cell Atlas datasets (Ji 2020 and Kurten 2021) were used to predict cell types. Enrichment analysis of differently expressed genes was performed using Metascape.

RESULTS: Our study identified 19 clusters, including T cell, macrophage, and myeloid clusters, with differentially expressed genes related to protein synthesis (PS), extracellular matrix remodeling (ECMR), angiogenesis (ANG), cytokine signaling (CS), and cell motility (CM). PS (RPL7), ECMM (MMPs), ANG (VEGFA), and CM (CXCL8) pathway genes were mostly overexpressed in HPV+ tumors. CS genes (IL1A and CXCL8) were overexpressed in T cells and Macrophages of HPV+ tumors. CS pathway genes overexpressed in myeloid cells include IL18 (HPV+) and CDKN1A (HPV-). In the malignant cell cluster, the top differentially expressed genes were: IL1A, IL24, ATP13A3, CCN1, AREG, FXYD3, CSRP2, CYP2C18, and KCTD1.

CONCLUSION: HPV alters the expression of markers in prooncogenic pathways of TME and malignant cells. Understanding how HPV infection alters the molecular pathway interactions in the TME is essential for identifying novel biomarkers and therapeutic targets that may improve penile cancer treatment outcomes.

IRB Approval: A9110113. Project Title: “Cáncer de Pene en Puerto Rico: Prevalencia, Distribución de Genotipo y Correlación con Virus del Papiloma Humano”. Institutions: Department of Pharmaceutical Sciences- UPR School of Pharmacy, San Juan, PR; UPR Comprehensive Cancer Center, San Juan, PR; Department of Surgery- Urology Section, UPR School of Medicine, San Juan, PR.; Department of Pathology - UPR School of Medicine, San Juan, PR; Department of Urology – UPR Carolina Hospital, Carolina, PR.

DYNAMIC IMMUNE MODULATION IN CERVICAL CANCER PATIENTS UNDERGOING CHEMORADIATION: INSIGHTS FROM A HISPANIC-DOMINANT COHORT

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INTRODUCTION: Cervical cancer, primarily caused by persistent human papillomavirus (HPV) infection, disproportionately affects Hispanic women, who experience higher incidence and mortality rates than non-Hispanic white women. While chemoradiation is a standard treatment, its effects on the tumor immune microenvironment in Hispanic patients remain poorly understood. This study characterizes key immunological shifts during chemoradiation and identifies potential biomarkers for treatment response.

METHODS: Vaginal cytobrush and peripheral blood mononuclear cell (PBMC) samples were collected from cervical cancer patients undergoing chemoradiation at MD Anderson Cancer Center. Samples were obtained before treatment (T1), one week after treatment (T2), and five weeks after treatment (T4). Flow cytometry quantified T lymphocytes, myeloid cells, and their activation state in blood and cervical tissues. This study was approved by the IRB.

RESULTS: Interestingly, Hispanic patients exhibited a reduced frequency of CD4+ T cells and PD-1 expression in blood compared to other racial groups at baseline. Significant immune shifts were observed across treatment time points. CD103+ expression among CD4+ T cells increased at T4. Also, PD-1 expression on CD4+ T cells initially decreased at T2 but rose at T4.

CONCLUSION: These findings suggest dynamic immune changes throughout chemoradiation.. The long-term goal is to identify immune and microbial biomarkers associated with treatment response in Hispanic individuals, which could lead to more effective and accessible treatments for this population.

CHARACTERIZING MYELOID-DERIVED SUPPRESSOR CELLS IN RESPONSE TO CHRONIC STRESS IN MURINE MODELS OF OVARIAN CANCER

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INTRODUCTION: Ovarian cancer (OC) ranks as the fifth- and seventh-leading cause of cancer-related death among females in the United States and Puerto Rico, respectively. Chronic stress has been shown to increase tumor-associated inflammation, induce immunosuppression, and promote disease progression. Myeloid-Derived Suppressor Cells (MDSC) are immature and immunosuppressive cells that play a critical role in the tumor microenvironment (TME). However, the impact of chronic stress on MDSC infiltration and function in OC remains poorly understood. This study aims to elucidate the role of chronic stress on MDSC biology within the OC TME. We hypothesize that chronic stress enhances MDSC infiltration and differentiation within the OC TME, driving OC progression.

METHODS: To address this, we inoculated female C57BL/6 mice with ID8^{Luc} or IG10^{Luc} OC cells and subjected them to daily restraint stress. Mice were sacrificed weekly to collect tumors and bone marrow, followed by immunofluorescence and flow cytometry analyses to characterize MDSC. Additionally, we isolated bone marrow from C57BL/6 mice to obtain myeloid cell precursors, differentiated them *ex vivo* into MDSC, and treated them with stress hormones.

RESULTS: Our results suggest that chronic restraint stress increases MDSC infiltration and polymorphonuclear (PMN)-MDSC enrichment in the TME and bone marrow in both syngeneic mouse models. Findings from the *ex vivo* experiments indicated increased PMN-MDSC enrichment alongside a depletion of mononuclear (M)-MDSC in the groups treated with stress hormones.

CONCLUSION: These results suggest that chronic stress can regulate MDSC infiltration and function, enhance the immunosuppressive characteristics of the OC TME, and contribute to disease progression.

Funding: PHSU G-RISE (R25GM082406, T32GM144896), R21CA253555, R21CA253555-S1, PHSU/MCC Partnership (U54CA163071, U54CA163068), PHSU RCMI (U54MD007579), R01CA276224, U01CA290613, Intellectus Foundation.

IACUC Approval: This study was reviewed and approved by the Institutional Animal Care and Use Committee (IACUC) at Ponce Research Institute (PRI); approval number 2004000282.

THE ROLE OF AMYLOID-B METABOLISM IN TUMOR PROGRESSION AND PATIENT SURVIVAL

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INTRODUCTION: Glioblastoma (GBM) is an aggressive brain tumor with a poor prognosis, and identifying biomarkers for targeted therapies remains a significant challenge. This study investigates the role of amyloid-β metabolism in GBM development, focusing on key genes involved in its regulation.

METHODS: Clinical data from cBioPortal for Cancer Genomics were analyzed, looking at the expression of genes such as amyloid precursor protein (APP), presenilins (PSEN1, PSENEN), basigin (BSG), β-secretase (BACE1), and others. Results showed that high expression of PSENEN in females and low expression of BSG correlated with improved survival. Additionally, high expression of the BACE1 inhibitor PPARA was associated with better survival in both males and females, while high ADAM10 expression correlated with improved survival in males.

RESULTS: These findings highlight sex-specific differences in gene expression and survival outcomes, with PPARA emerging as a potential protective factor in GBM progression. The results contribute valuable insights into amyloid-β regulation mechanisms and propose key therapeutic targets for improving GBM treatment.

CONCLUSION: The study identified sex-specific differences in gene expression in glioblastoma (GBM) patients, with over-expression of PSENEN and PPARA in females and PPARA and ADAM10 in males linked to improved survival. The findings suggest PPARA's protective role in GBM progression and reveal potential gene interactions, offering insights into amyloid-β regulation and new therapeutic targets.

Funding: This study was supported by: NIH Grants 1R15CA287203 and 1R16GM153522.

MAPPING GLIOBLASTOMA IN PUERTO RICO: INSIGHTS FROM A 21-YEAR REGISTRY REVIEW

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INTRODUCTION: Although extensively studied in the United States, limited data exist on its incidence, geographic distribution, and treatment modalities in Puerto Rico. This study aims to describe, for the first time, these epidemiological patterns of glioblastomas (GBM) on the island.

METHODS: Under our "PUNCTURE" IRB (2210058273), we studied all GBM cases diagnosed from 2000 to 2020 as reported on the Puerto Rico Central Cancer Registry. We focused our analysis on incidence, geographic distribution, and treatment modalities.

RESULTS: A total of 1,334 patients with histologically confirmed GBM were identified. The majority were male (54.2%). The municipalities with the highest number of cases were San Juan (n=142), Bayamón (n=86), Caguas (n=66), Carolina (n=66), and Ponce (n=58). Regarding patient outcomes, 109 individuals remained alive at the time of data collection. Among the deceased, 875 patients died due to tumor progression. The overall incidence of GBM in Puerto Rico was 1.78 per 100,000 population. Stratified analyses of geographic distribution, incidence trends over time, and treatment modalities were performed and are available in the supplementary information.

CONCLUSION: This study provides the first geolocation analysis of GBM in Puerto Rico, offering critical epidemiological insights. Our findings highlight geographic variations of GBM in Puerto Rico. With an overall incidence of 1.78 per 100,000 population, GBM represents a significant public health concern. Further studies are needed to evaluate potential environmental, genetic, and healthcare access factors influencing disease patterns and treatment outcomes in Puerto Rico.

PYK2 SIGNALING MODULATES IMMUNE MICROENVIRONMENT AND CYTOKINE RELEASE IN GLIOBLASTOMA

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INTRODUCTION: Glioblastoma (GBM) is an aggressive brain cancer with a median survival of less than a year. Our studies show a correlation between activation of proline-rich non-receptor tyrosine kinase (Pyk2) in GBM cells and cytokine expression by tumor-associated myeloid cells (TAMs). This activation increases levels of monocyte chemoattractant protein 1 (CCL2), granulocyte-macrophage colony-stimulating factor (GM-CSF), IL10, IL12, and vascular endothelial growth factor (VEGF) while elevating CD86+/CD206+ TAM population. We hypothesize that Pyk2 signaling in GBM cells modulates cytokine release, suppressing immune responses in the tumor microenvironment.

METHODS: Primary human GBM cell lines and the GL261/C57Bl/6 mouse glioma implantation model were used. CRISPR/Cas9 utilized to knock out Pyk2 (Pyk2KO) in GL261 and primary human GBM cells. Cytokine levels were quantified using a cytokine antibody array with RT-PCR analysis to assess cytokine gene expression and release. Flow cytometric analysis was conducted to quantify the expression of programmed death-ligand 1 (PD-L1) on cell surfaces and to analyze TAMs in Pyk2KO and wild-type (WT) tumors.

RESULTS: Cytokine analysis showed decreased CCL2 and CCL5 release in Pyk2KO cells. RT-PCR of myeloid cells from GL261 tumors revealed downregulation of pro-tumorigenic factors, including CCL2, CCL12, CCL5, tumor necrosis factor (TNF), VEGF, and epidermal growth factor (EGF) in Pyk2KO tumors. Flow cytometry showed fewer myeloid-derived suppressor cells (MDSCs), more dendritic cells (DCs), and increased TNF/IFNγ-expressing CD8+ T cells. Pyk2KO tumors also had fewer Ly6C+/CD206+ pro-tumorigenic cells and more inflammatory Ly6C+/CD86+ myeloid cells.

CONCLUSION: Pyk2KO tumors develop a more immunocompetent microenvironment with enhanced phagocytic and cytotoxic function.

Funding: This study was supported by: NIH Grants 1R15CA287203 and 1R16GM153522.

IACUC approval: 036-2023-07-01-PHA-IBC

PYK2 AND MEK/ERK SIGNALING PATHWAYS MODULATE EXTRACELLULAR VESICLE SECRETION IN GLIOBLASTOMA

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INTRODUCTION: Glioblastoma (GBM) is the most aggressive primary brain tumor, characterized by a highly immunosuppressive microenvironment that limits treatment efficacy. GBM cells utilize extracellular vesicles (EVs) to modulate immune responses, promoting tumor progression. This study explores the role of Proline-Rich Tyrosine Kinase 2 (Pyk2) and MEK/Erk signaling in EV biogenesis and immune regulation in GBM. We hypothesize that Pyk2/MEK/Erk signaling regulates EV release by modulating the actin cytoskeleton, impacting TAM activation in GBM.

METHODS: CRISPR/Cas9-mediated knockout of Pyk2 (Pyk2KO) was performed in two primary human GBM cell lines. EV characterization was conducted using flow cytometry, western blot, and PCR. Immunomodulatory cytokine levels were analyzed to assess changes in immune signaling.

RESULTS: Pyk2KO cells exhibited a shift toward larger EVs and a reduced proportion of Integrin+ EVs compared to wild-type (WT) cells. Additionally, EVs from Pyk2KO cells significantly decreased key immunomodulatory cytokines, including CCL2, CCL5, TNF, and VEGF.

CONCLUSION: These findings identify Pyk2 as a key regulator of the EV landscape in GBM and suggest that targeting Pyk2 and MEK/Erk signaling may help mitigate EV-driven immune suppression. Understanding these mechanisms provides a foundation for novel therapeutic strategies to enhance immunotherapy efficacy in GBM.

Funding: NIH Grant 1R15CA287203.

IRB Approval: All experimental procedures were carried out in accordance with the broad consent approved by the Institutional Review Board (IRB) Human Research Subject Protection Office (protocol #2012-12B, July 16, 2019).

ENDOPLASMIC RETICULUM STRESS PROTEIN GRP78 AS A THERAPEUTIC TARGET IN GLIOBLASTOMA

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INTRODUCTION: Glioblastoma multiforme (GBM) is the most aggressive primary brain tumor, with significant resistance to chemotherapy. Endoplasmic reticulum (ER) stress, activated by glucose-regulated protein 78 (GRP78), plays a key role in GBM progression. GRP78 is a central marker of ER stress, activating the unfolded protein response (UPR), and has emerged as a promising therapeutic target. Our study investigates the biological mechanisms by which GRP78 mediates GBM progression and chemotherapy resistance. Preliminary data show that GRP78 is overexpressed in GBM tumors compared to normal brain tissue and correlates with increased proliferation and resistance to temozolomide in glioma cells.

METHODS: We used various experimental approaches, including viability assays, flow cytometry, Western blotting, qRT-PCR, and quantitative proteomics, to assess GRP78's role in cell proliferation, survival, and ER stress. Primary GBM cell lines (A172) and GBM tissue samples were used in the study. Tumor implantation models with glioma cells were implanted in immunocompromised mice to assess tumor growth and response to GRP78- targeted therapies. All human and animal procedures were approved by the IRB and IACUC.

RESULTS: Preliminary data suggest that GRP78 promotes migration, proliferation, and survival in glioma cells. Treatment with the anti-GRP78 antibody PAT-SM6 reversed UPR signaling, leading to apoptosis and reduced proliferation. In the animal model, targeting GRP78 inhibited tumor growth and enhanced the anti-tumor effects of temozolomide.

CONCLUSION: These results suggest that GRP78 is a potential therapeutic target for GBM, providing insights for future therapeutic strategies.

Funding: This research was funded by Title V, US Department of Education: UPR-RCM Title V Grant Award # P031S200104 (N.M.B).

IACUC Approval: All animal procedures were approved by the SUNY Upstate Medical University IACUC# 412.

SEX-BASED DIFFERENCES IN OSTEOSARCOMA REVEALED THROUGH GENE SET ENRICHMENT ANALYSIS

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INTRODUCTION: Sex-based disparities in osteosarcoma incidence and outcomes have been widely reported, with males showing more aggressive tumors and poorer survival. This study investigates the molecular mechanisms underlying these differences using gene expression data from the TARGET (Therapeutically Applicable Research to Generate Effective Treatments) dataset.

METHODS: Gene expression data from 37 female and 51 male osteosarcoma samples were compared using gene set enrichment analysis. Pathways of interest focused on Hallmark gene sets from the Molecular Signatures Database. Cytoscape and GeneMANIA were used to further analyze core enriched genes. This study utilized The Cancer Genome Atlas data and did not require Institutional Review Board approval.

RESULTS: Males exhibited significant enrichment in glycolysis (NES = 2.01, q = 0.045) and G2M checkpoint (NES = 1.98, q = 0.046) pathways. Further analysis revealed enrichment in carbohydrate biosynthesis (q = 6.80E-19) and aminoglycan metabolism (q = 2.80E-19) in males.

CONCLUSION: Sex-based molecular differences in osteosarcoma, particularly in metabolic pathways, were revealed in this study. These results may be relevant regarding the aggressive tumor behavior in males.

LAYERED ZIRCONIUM PHOSPHATE NANOPARTICLES AS ANTICANCER DRUG CARRIER

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INTRODUCTION: Mitoxantrone (MTX) is an anticancer drug that inhibits topoisomerase II and disrupts DNA synthesis. However, it can cause systemic toxicity because it lacks selectivity between healthy and cancer cells. This study proposes using zirconium phosphate nanoparticles (ZrPNps) as carriers for MTX. ZrPNps are inorganic structures composed of layers of zirconium atoms linked by phosphate groups, which have shown no cytotoxic effects on either healthy or cancer cells.

METHODS: ZrPNps were synthesized by refluxing a solution of ZrOCl2 and H3PO4 for 48 h at 94˚C. Solutions with different molar ratios of MTX and ZrPNps were prepared to obtain MTX@ZrP. MTX@ZrP was characterized by spectroscopic, microscopic, and X-ray diffraction techniques. Thermogravimetric analysis (TGA) was performed to determine the drug loading capacity; a drug release test was carried out using simulated body fluid and artificial lysosomal fluid buffers at pH 7.4 and 4.5, respectively, to investigate the biological conditions affecting MTX release from ZrPNps. Cell viability studies were performed to evaluate the cytotoxic effect of MTX@ZrP on PC3 cells.

RESULTS: TGA showed that the MTX@ZrP molar ratio with the highest drug loading capacity was 1:1. The DRT showed that MTX was not released from ZrPNps at pH 7.4, but it does at pH 4.5, which simulates the lysosomal environment of cancer cells. PC3 cell viability studies showed that MTX@ZrP produced a cytotoxic effect.

CONCLUSION: These findings suggest that ZrPNPs effectively serve as carriers for MTX, as the release of MTX from these nanoparticles is pH-dependent while maintaining cytotoxic activity against PC3 cells.

IRB Approval: N/A, exempt. It does not involve human subjects.

ASTROCYTES INFLAMMATORY PHENOTYPE IN RESPONSE TO PATHOGENIC BACTERIAL PRODUCTS

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INTRODUCTION: Neurodegenerative diseases are characterized by neuronal decline, inflammation, and blood-brain barrier (BBB) dysfunction. Astrocytes, essential glial cells for BBB maintenance, can develop a reactive phenotype under inflammatory conditions, contributing to neurodegeneration. Lipopolysaccharide from *Porphyromonas gingivalis* (Pg-LPS), an oral pathogen, has been shown to cross the BBB and induce inflammation, but its effects on astrocyte reactivity remain unclear. This study aims to characterize astrocyte phenotype following exposure to Pg-LPS compared to other bacterial products, including *Staphylococcus aureus* lipoteichoic acid (LTA).

METHODS: Human primary astrocytes were exposed to Pg-LPS or LTA for 24 or 48 hours. Dose curves for Pg-LPS and LTA and astrocyte viability were measured by MTT. GFAP and iNOS, inflammatory markers, were measured via western blot. TNF-α, IL-6, and IL-10 cytokines were quantified in supernatants by ELISA.

RESULTS: Pg-LPS significantly increases astrocyte viability at 24h ($p=0.01$). LPS nor LTA affect viability at 48h. Western blots revealed slightly higher GFAP and iNOS levels at 48h compared to 24h, suggesting longer Pg-LPS exposure may trigger the inflammatory response. At 48h, LTA exposure induced higher iNOS expression than Pg-LPS. Additionally, Pg-LPS exposure for 24h resulted in reduced TNF-α and IL-6 secretion compared to untreated controls. IL-10 was detected only after 48h exposure to both products, indicating a potential anti-inflammatory response.

CONCLUSION: Pg-LPS and LTA do not induce significant astrogliosis but differentially modulate astrocyte inflammatory markers, influencing their phenotype. Further research using advanced in-vitro models, such as brain organoids, is needed to elucidate astrocyte contributions to neurodegeneration under acute and chronic inflammation.

IRB approval: UPR-MSC IRB Exemption Protocol Number: 2409293223.

THE IMPACT OF *PORPHYROMONAS GINGIVALIS* LIPOPOLYSACCHARIDES ON HUMAN ASTROCYTES PROLIFERATION

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INTRODUCTION: *Porphyromonas gingivalis* (Pg) is an oral pathogen associated with periodontitis and various systemic inflammatory conditions. Its lipopolysaccharides (Pg-LPS) can cross the blood-brain barrier (BBB), triggering neuroinflammation that may contribute to progression of neurological diseases and cancer. Astrocytes, key glial cells that maintain brain homeostasis and BBB integrity, play a critical role in the tumor microenvironment by supporting tumor growth and immune evasion. We hypothesize that chronic exposure to Pg-LPS may induce astrocyte reactivity and alter their function, influencing glioma progression.

METHODS: Human astrocytes were treated with Pg-LPS and lipoteichoic acid (LTA) for 24 and 48 hours, and assayed for viability through MTT. Proliferation marker Ki67 and astrogliosis markers GFAP and pERK1/2 were quantified using western blot and immunofluorescence.

RESULTS: Pg-LPS induced higher astrocyte activity and viability at 24h (p=0.01) but not at 48h. There were no significant changes in Ki67, and a slight increase in pERK1/2 at 24h. At 48 hours, Ki67 levels decreased, indicating possible inhibition of astrocyte proliferation at longer exposure times, whereas pERK1/2 doubled, particularly at high LPS concentrations, suggesting cellular activation. Immunofluorescence at 24 hours showed no detectable changes in GFAP or Ki67 expression, reinforcing that astrocyte activation and proliferation are not immediate responses to Pg-LPS stimulation.

CONCLUSION: These findings suggest that Pg-LPS shifts astrocyte proliferation and activation at different exposure times, with possible involvement of the ERK signaling pathway. Further studies are needed to elucidate the long-term effects of Pg-LPS exposure on astrocyte function within the tumor microenvironment.

Funding: This research was supported by the REPMIC program (Grant #R25AI183304-01) at the University of Puerto Rico Comprehensive Cancer Center, funded by the NIAID of the NIH; and 5K22NS118975-04, U54GM133807, 5P20GM103475, U54MD007600, PO31S200104.

IRB Approval: This research does not involve clinical samples and therefore does not require IRB approval. The astrocyte cells used in this study are commercially available and are cultured in the lab.

PREVALENCE OF *STREPTOCOCCUS AGALACTIAE* IN MILK SAMPLES FROM COWS WITH SUB-CLINICAL MASTITIS

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INTRODUCTION: Mastitis is an inflammation of the mammary gland during lactation. It is the most common disease of dairy cattle and the costliest disease on dairy farms. A dairy farm can lose profit through decreased milk yield, treatment costs, discarded milk, premature culling, decreased genetic potential, and decreased reproductive performance. The specific aim of this study is to isolate, characterize, and identify S. agalactiae in milk samples from dairy cows with suspected mastitis in farms from Puerto Rico, using microbiology and molecular biology techniques.

METHODS: Milk samples were collected from 24 cows and inoculated in Strep B agar and Edwards Medium and incubated at 37°C for 24-48 hours. Determination of colony forming units and morphological analysis is then performed to select suspected S. agalactiae colonies based on known characteristics. Further characterization is achieved by biochemical testing for the presence of coagulase, catalase, oxidase, pyrase, fermentation of mannitol, maltose, dextrose, sucrose and lactose, and CAMP test using S. aureus as a control. Lastly, conventional PCR amplification of target gene sklA3 is performed for the final identification of S. agalactiae in milk sample's cultures.

RESULTS: Preliminary data suggests that 12 of 38 cows with mastitis are infected with S.agalactiae in this farm. This translates to a higher prevalence (32%) of Streptococcus agalactiae in this herd compared to herds worldwide.

CONCLUSIONS: Current progress in our project is focused in developing quantitative real-time PCR protocol for fast identification of S. agalactiae directly from milk and perform antibiotic resistance testing on isolated colonies.

Funding: MSEIP CONNECT: Creating Opportunities through Networking, Education, Community-building, and Training. US Department of Education Title III: Minority Science and Engineering Improvement Program (MSEIP) UPR-Aguadilla (Grant No. P120A230018).

IACUC Approval: 2023.12, University of Puerto Rico-Aguadilla.

CHARACTERIZATION OF INFLAMMATORY IMMUNE RESPONSE TO PATHOGEN-INDUCED MASTITIS DURING LACTATION

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INTRODUCTION: Mastitis a pathogenic-induced chronic inflammation of the mammary gland which causes sustained activation of the innate immune response leading to cessation of lactation. Our study aimed to decipher the profile of pro-inflammatory signaling pathways activated via toll-like receptors, including transcription factors, inflammatory cytokines and enzymes known to play a crucial role in causing the pathological effects associated with chronic inflammation in other tissues.

METHODS: Mammary tissue was collected from three mastitis and healthy lactating cows for mRNA and protein extraction. Specific primers were designed for all target genes. The expression profile of key genes was investigated by quantitative real-time polymerase chain reaction (qPCR) and further validated at the protein level by Western blot technique. Student t-test analysis was used to determine differences between the two groups.

RESULTS: Preliminary data indicate an upregulation of TLR-3 and key signaling molecules such as nuclear factor kappa beta (NF-κB) and cyclooxigenase-2 (COX2) in mammary tissue during mastitis. We further tested the presence and expression profile of the anti-inflammatory cannabinoid receptor type 2 (CB2) in bovine mammary tissue during lactation, which points to a potential therapeutic target for mastitis treatment.

CONCLUSION: Ongoing research aims to validate the expression changes observed at mRNA level by employing Western blot analysis of mammary tissue and flow cytometry evaluation of cell populations to elucidate their role in the inflammatory process. Future studies will investigate the therapeutic potential of CB2 modulation and its effects on inflammatory pathways in mammary epithelial cell cultures.

Funding: Academic Research and Enhancement Award (AREA) Program. NIH Eunice Kennedy Shriver National Institute of Child Health and Human Development R15 AREA Program, Grant No. 1R15HD109919-01 and Creating Opportunities through Networking, Education, Community-building, and Training. US Department of Education Title III: Minority Science and Engineering Improvement Program (MSEIP) UPR-Aguadilla (Grant No. P120A230018).

IACUC approval number: 2023.12.

INVESTIGATING THE INFLAMMATORY CYTOKINE PROFILE OF MILK FROM COWS WITH SUBCLINICAL MASTITIS

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INTRODUCTION: One of the major global causes of nursing cessation is mastitis, a chronic inflammatory response of the mammary gland to recurrent pathogenic infection or tissue injury. There is no test for subclinical mastitis and patients are diagnosed after the disease has turned to clinical, and nursing has been interrupted mostly due to pain. Furthermore, there is a dearth of information on the changes in milk integrity and presence of inflammatory modulators in milk produced during subclinical mastitis that could serve as early biomarkers for this disease. We aim to investigate the inflammatory cytokine profile in milk of cows with subclinical mastitis.

METHODS: Milk samples were collected from cows with subclinical mastitis and healthy cows, after diagnosis using the California Mastitis Test (CMT). Fifty (50) microliters of milk where used for mRNA extraction using the MagMax CORE kit with modifications and using magnetic beads. Quantitative real-time PCR is used to analyze gene expression. Statistical analysis was performed using delta delta Ct method.

RESULTS: Preliminary data suggests elevated content of Tumor Necrosis Factor- alpha (TNF-α), interleukin 1- Beta (IL-1β), interleukin 6 (IL-6), interleukin 8 (IL-8), interleukin 12A (IL-12A), interleukin 12B (IL-12B), interleukin 10 (IL-10), interleukin 23 (IL-23) in mammary tissue. Current progress is focused on detecting and quantifying these cytokines in milk.

CONCLUSION: This pilot study demonstrates inflammatory cytokine profile is dysregulated during mastitis. Our final goal is to develop a minimally invasive fast assay to easily monitor inflammatory status during mastitis in milk.

Funding: Academic Research and Enhancement Award (AREA) Program. NIH Eunice Kennedy Shriver National Institute of Child Health and Human Development R15 AREA Program, Grant No. 1R15HD109919-01.

IACUC Approval: #2023.12. Faculty Advisor/mentor: Dra. Juliana Pérez Laspiur, juliana.perez-laspiur@upr.edu

ROLE OF TRPV4 AND ASSOCIATED PRO-INFLAMMATORY PATHWAYS IN CHRONIC MASTITIS

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INTRODUCTION: Chronic mastitis, an inflammatory condition of the mammary gland, is marked by persistent upregulation of pro-inflammatory modulators, leading to tissue damage, impaired function, and lactation cessation. Key players in understanding mastitis are the transient receptor potential vanilloid 4 (TRPV4) channel, cyclooxygenase-2 (COX-2), and nuclear factor kappa-light-chain-enhancer of activated B cells (NF-κB), which collectively drive the inflammatory response.

METHODS: The current study aims to characterize the TRPV4 signaling pathway by examining additional pro-inflammatory markers, including NF-κB p65, mitogen-activated protein kinases (MAPKs), protease-activated receptor 2 (PAR2), and lipoxygenases (LOX). Gene expression of these markers will be assessed using quantitative PCR (qPCR) with bovine-specific primers. Protein expression levels for key markers will be quantified via Western blot analysis. IACUC not required.

RESULTS: Our previous research confirmed the presence of TRPV4, COX-2, and NF-κB subunits 1 and 2 in mastitis-affected bovine mammary tissue through qPCR. The results showed their upregulation in inflamed tissues, highlighting TRPV4's key role in mediating inflammation. TRPV4 showed a 28.9-fold increase, while NF-κB subunit 1 exhibited a 36.5-fold increase and NF-κB subunit 2 a 6.9-fold increase. Additionally, COX-2 expression was upregulated by 21-fold.

CONCLUSION: Insights from these analyses will guide future research into developing therapeutic interventions aimed at mitigating inflammation and preserving glandular function. Future phases include cell culture models to validate findings and explore pharmaceutical modulation of TRPV4 and its pathways. This research aims to improve mastitis management in dairy production and clinical settings, addressing the need for innovative solutions due to increasing antibiotic resistance.

Funding: Academic Research and Enhancement Award (AREA) Program. NIH Eunice Kennedy Shriver National Institute of Child Health and Human Development R15 AREA Program, (Grant No. 1R15HD109919-01), and MSEIP CONNECT. Creating Opportunities through Networking, Education, Community-building, and Training. US Department of Education Title III: Minority Science and Engineering Improvement Program (MSEIP) UPR-Aguadilla (Grant No. P120A230018).

IACUC Approval: 2023.12

IDENTIFICATION OF CLOSTRIDIUM PERFRINGENS AS A MAMMARY PATHOGENIC ANAEROBIC BACTERIA IN PUERTO RICO

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INTRODUCTION: Anaerobic bacteria, such as *Clostridium perfringens* (*CP*), are considered highly dangerous because of a high degree of pathogenicity, antibiotic resistance and very difficult eradication. Mastitis is a disease that halts milk production and lactation and thus threatens infant nutrition in developing countries. The objective of this study is to develop easy and fast laboratory assays to detect and identify mastitis cases caused by *CP*.

METHODS: To achieve this goal, we collected milk samples from 24 cows with mastitis followed by inoculation and growth in blood agar and *CP* Chromoselect agar. Morphological and biochemical testing was performed in all isolates. For molecular confirmation, DNA was extracted from bacterial isolates and amplification of target genes (alpha-toxin) was performed by real-time polymerase chain reaction analysis (qRT-PCR).

RESULTS: Twenty-four milk samples from cows with mastitis were inoculated in selective agars. Of thirteen *CP* isolates only 5 of were gram positive bacillus. Biochemical testing revealed that only 3 of those isolates could hydrolyze gelatin but only one was positive for lactose fermentation and casein digestion in litmus milk. Molecular confirmation of isolates is in progress by qRT-PCR amplification of the alpha-toxin gene.

CONCLUSION: Preliminary data based on morphological and biochemical characterization, suggests *CP* may be causing mastitis in only 1 cow out of 24. Current efforts are focused on improving the isolation of colonies and the qRT-PCR protocol. The identification of *CP* will contribute to adequate treatments reducing clinical mastitis in lactating mammary glands allowing successful diagnosis and adequate treatment plans.

Funding: Creating Opportunities through Networking, Education, Community-building, and Training. US Department of Education Title III: Minority Science and Engineering Improvement Program (MSEIP) UPR-Aguadilla (Grant No. P120A230018), and Academic Research and Enhancement Award (AREA) Program. NIH Eunice Kennedy Shriver National Institute of Child Health and Human Development R15 AREA Program, Grant No. 1R15HD109919-01.

IACUC approval: 2023.01.

EXPRESSION OF REPRODUCTIVE HORMONES IN A SNAIL HOST FOR SCHISTOSOMIASIS

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INTRODUCTION: Schistosomiasis affects over 200 million people in tropical regions worldwide. The snail *Biomphalaria* serves as a key host for Schistosoma mansoni, the parasite causing the most common form of human schistosomiasis. Infected snails show reduced egg production, suggesting energy is redirected toward parasite development. However, the impact of parasitism on *Biomphalaria*'s reproductive physiology remains unclear. Understanding the localization of the reproductive hormone CDCH will enhance knowledge of host-parasite interactions.

METHODS: This study utilized standard histological procedures, *in situ* hybridization, and immunohistochemistry to localize the reproductive caudodorsal hormone (CDCH) in the CNS of *Biomphalaria*. Immunohistochemistry negative controls were included as a way to confirm the integrity of the procedure. All protocols were approved by the UPS MSC IACUC (Protocol #3220119).

RESULTS: Most CDCH cells were clustered in the right and left cerebral ganglia, with fewer in the right parietal and pedal ganglia. Prominent CDCH-like immunoreactive (CDCH-li) fibers were observed in the cerebral commissure, a neurosecretory region between the cerebral hemiganglia. This localization agrees with previous findings in other pulmonate snails, indicating CDCH is secreted into circulation to regulate reproductive behaviors. CDCH expression was also detected in the peripheral nervous system, particularly in female reproductive organs.

CONCLUSION: These findings indicate that CDCH regulates female reproduction in *Biomphalaria*. Future studies will investigate whether CDCH expression changes during *Schistosoma mansoni* infection.

Funding: Supported by the National Institutes of Health: MD007600 (RCMI), P30GM149367 (COBRE); National Science Foundation: IOS-2217657 (OSIB), EES-1736019 (CREST), OISE-1545803 (PIRE), and DBI-1337284. Imaging support was provided by the UPR COBRE Center for Neuroplasticity, Neuroimaging and Electrophysiology Facility (NIEF).

MYOMODULIN EXPRESSION IN BIOMPHALARIA GLABRATA, A HOST FOR HUMAN SCHISTOSOMIASIS

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INTRODUCTION: Schistosomiasis, or snail fever, is a parasitic disease caused by schistosome blood flukes. It affects millions of people in tropical and subtropical regions with poor sanitation. *Schistosoma mansoni* requires *Biomphalaria* snails as intermediate hosts, where it develops into the cercarial form that can infect humans. This reearch aims to identify neuropeptide expression in the central nervous system (CNS) of *Biomphalaria glabrata*, a major S. mansoni vector. Understanding host-parasite interactions could reveal physiological and behavioral changes in infected snails, informing vector control strategies. The present study examined expression of the neuropeptide myomodulin, a regulator of muscle contractions and behaviors like feeding and locomotion in gastropods.

METHODS: Myomodulin expression was examined in the CNS and peripheral tissues of B. glabrata using whole-mount immunohistochemistry. Dissected CNS and peripheral tissues were analyzed following IACUC-approved protocols.

RESULTS: Myomodulin expression was detected in the central ganglia, with immunohistochemical analysis revealing myomodulin-positive cell clusters in the buccal and pedal ganglia. The cerebral ganglia showed abundant expression, with additional presence in some peripheral tissues.

CONCLUSION: Mapping myomodulin localization in *B. glabrata* enhances our understanding of host-parasite interactions in this biomedical model, potentially informing future vector control strategies.

Funding: Supported by the National Institutes of Health: MD007600 (RCMI), P30GM149367 (COBRE); National Science Foundation: IOS-2217657 (OSIB), HRD-1137725 (CREST), OISE-1545803 (PIRE), and DBI-1337284. Imaging support was provided by the UPR COBRE Center for Neuroplasticity, Neuroimaging and Electrophysiology Facility (NIEF).

MENTAL CONTAMINANTS IN *DIADEMA ANTILLARUM* FROM PUERTO RICO: INSIGHTS FROM A METABOLOMICS STUDY

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INTRODUCTION: A recent outbreak severely affected populations of the sea urchin *Diadema antillarum*, a crucial benthic herbivore in Caribbean reef ecosystems, raising concerns about environmental stressors affecting its health. This study aimed to investigate gut metabolite profiles and the accumulation of environmental contaminants in *D. antillarum* collected from four beaches in Puerto Rico.

Methods: We employed untargeted gas chromatography-mass spectrometry (GC/MS) metabolomics to analyze gut metabolites of *D. antillarum* collected from four sites in Puerto Rico: Cerro Gordo (n=6), Sardinera (n=9), Punta Bandera (n=7), and Culebra (n=11). Gut samples were extracted, weighed, and analyzed using GC/MS. The resulting data were processed and analyzed using the MetaboAnalyst.ca platform.

Results: The GC/MS analysis of gut metabolites in *D. antillarum* identified environmental contaminants associated with the industrial production of nitrilated goods (e.g., gloves, belts, gaskets, oil seals), waxes, lubricants, corrosion inhibitors, pesticides, bleaching agents, detergents, and industrial solvents. Heatmap cluster analysis and one-way ANOVA revealed the highest levels of pollutants, such as ethanolamine, sulfamic acid, and 2-butene-1,4-diol, in urchin guts from Culebra site, characterized by consistently high concentrations and significant FDR values, while Cerro Gordo exhibited the lowest contamination among the sites.

Conclusions: Our findings reveal site-specific environmental contaminants in the gut of *D. antillarum*. Elevated contaminant levels in Culebra are likely linked to localized pollution from human activity, industrial runoff, or shipping routes, raising concerns about potential impacts on marine ecosystems and this ecologically important species. In contrast, Cerro Gordo showed minimal contamination, reflecting lower industrial influence and better water circulation or reduced local pollutant inputs. These results emphasize the need for targeted conservation and pollution mitigation strategies to protect *D. antillarum* and its habitat. Further research is essential to assess the long-term effects of these contaminants and to guide effective conservation efforts.

Funding: This research was supported by the NSF-RAPID Award #2243580 and the NIH/NIGMS-PRINBRE Grant #5P20GM103475.

IACUC Approval: All procedures were approved by the University of Puerto Rico Medical Sciences IACUC protocol (A-5301118).

INTEGRATIVE METABOLOMICS APPROACH IDENTIFIES COMMON NEUROGENIC METABOLIC SIGNATURES IN IN VITRO AND IN VIVO MODELS

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INTRODUCTION: Animal studies have shown that running exercise enhances neuronal differentiation of progenitor cells in the hippocampus. Neurogenesis can be modeled in vitro by treating human neuroblastoma SH-SY5Y cells with retinoic acid. Since the induction of neurogenesis depends on metabolic reprogramming, uncovering conserved metabolic signatures across systems can help identify critical pathways involved in its regulation. Our study used a combined top-down and bottom-up metabolomics pipeline to decipher shared metabolic features between hippocampal tissue and a cellular neurogenic model.

METHODS: Metabolites were identified using gas chromatography-mass spectrometry in the hippocampus of 20-week-old male C57BL/6J sedentary and running mice and SH-SY5Y cells differentiated with retinoic acid (IACUC approved). Data was analyzed via statistical meta-analysis, identifying metabolites significantly elevated across datasets based on FDR-adjusted p-values. Pathway enrichment and mRNA-metabolite interactions were analyzed using OmicsNet with the KEGG database to uncover neurogenic pathways and biological processes.

RESULTS: Neurogenic stimuli used in both models significantly elevated asparagine, tryptophan, tyrosine, glutamine, and succinic acid. Pathway analysis revealed enrichment in tryptophan catabolism, serotonin and melatonin biosynthesis, metabolism of nucleotides, and the TCA cycle. Notably, TCA cycle enrichment indicated a shift from glycolysis to oxidative phosphorylation, a hallmark of neurogenesis reflecting increased mitochondrial activity.

CONCLUSION: This integrated pipeline identified conserved metabolic signatures and neurogenic pathways that bridge global tissue-level insights and cellular mechanisms, providing a versatile framework for studying other tissues and their corresponding cell models. Future directions include validating key metabolites and pathways as therapeutic targets to enhance neurogenesis or treat neurological disorders.

Funding: This work was supported by the NIH/NIGMS-PRINBRE Grant P20GM103475 and the UPR-MSC Deanship for Research Pilot Project Program.

IACUC Approval: All procedures were approved by the University of Puerto Rico Medical Sciences IACUC protocol (#A660121).

HISPANIC WOMEN'S STI KNOWLEDGE, ATTITUDES, BELIEFS, AND BEHAVIORS

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INTRODUCTION: In the US, 1 in 5 people have a sexually transmitted infection (STI), affecting a total of 68 million people, and nearly 50% of new cases occur between the ages of 15-24. In 2021, chlamydia, gonorrhea, and syphilis continued to increase in the US, likely due to the disruption of STI-related prevention and care services during the COVID-19 pandemic. We aimed to assess our patient population's knowledge, attitudes, beliefs, and behaviors regarding STI.

METHODS: Self-administered questionnaires were completed by female patients from San Juan City Hospital (SJCH). SJCH IRB no. 00002788.

RESULTS: N=113 patients, mostly aged between 21-29 years. Trichomonas was the least commonly known STI vs HIV, 23% vs 96%, respectively. 13% do not feel well educated about STI, and 20% have been tested for an STI at least once in a lifetime. 27% did not know if their partner had been tested, and 46% had never requested their partner to get tested. 21% of patients who admitted having a positive test result for an STI (24%) did not inform their partner, and 4% felt fear of disclosing the disease. Half of the participants admitted having been oriented about STI during a medical visit.

CONCLUSION: Our study showed that our community does not feel fully informed about STI and other sexual topics. We recognize it is imperative to provide adequate counseling, and we need to implement more STI orientation clinics to improve our patient's outcomes.

HPV INFECTIONS PROMOTE TYRAMINE CONSUMPTION IN THE CERVICOVAGINAL MICROBIOTA OF HISPANICS IN PUERTO RICO

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INTRODUCTION: Cervical disease progression due to high-risk human papillomavirus (hrHPV) infections can lead to the development of low-grade (LGSIL) and high-grade squamous intraepithelial lesions (HGSIL). Evidence suggests the cervicovaginal microbiota influences viral persistence and cancer progression. However, the metabolic mechanisms by which these microbial communities exert their effect remain unclear. Hence, we assessed the associations between the cervicovaginal microbiota and the metabolic milieu in women with cervical disease and hrHPV infections.

METHODS: Cervical swabs were collected from 38 non-menopausal women (IRB Streamlyne #2290033153) for genomic DNA extractions to assess 16S rRNA sequencing and HPV genotyping with SPF10-LiPA. Microbial assessment was completed with standard microbiome pipelines. Cervical cytology and dysplasia were also quantified. Furthermore, cervical lavages were used to perform untargeted metabolomics with Gas Chromatography, while multiomic pairing was achieved with the MIMOSA2 program.

RESULTS: While bacterial community composition showed no significant differences among cervical lesions (p-value>0.05), HGSIL samples demonstrated a higher richness compared to controls (p-value=0.01). Further assessment underscored an increase of *Prevotella bivia*, *Prevotella buccalis*, and *Lachnospiraceae G-9 oral taxon 924* in HGSIL. Also, HGSIL showed tyramine consumption, a biogenic amine associated to cancer development. *Methanobrevibacter* was the sole positive predictor for tyramine decarboxylation, while *Pseudomonas citronellolis* and *Akkermansia muciniphila* showed a positive contribution to tyramine oxidation.

CONCLUSION: Cervical lesions and HPV risk linked to alterations in the cervicovaginal microbiome and its metabolic environment emphasize the role of strictly anaerobic bacteria. Further research is needed to understand the molecular mechanisms by which these microbes contribute to cervical disease progression.

Funding: Funding support was provided by the NIH Center for Collaborative Research in Minority Health and Health Disparities (RCMI) 2U54MD007600, the Puerto Rico Clinical and Translational Research Consortium (PRCTRC) U54MD007587, and the Puerto Rico IDeA Network Biomedical Research Excellence (PR-INBRE) 5P20GM103475-17.

THE CERVICOVAGINAL MICROBIOTA IS INFLUENCED BY BMI IN HISPANIC WOMEN WITH CERVICAL DISEASE AND HPV INFECTIONS

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INTRODUCTION: The least diverse niche of the female body is the cervicovaginal tract. It is characterized by five community state types (CSTs) depending on the relative abundance of Lactobacilli. Changes in the relative abundance of these communities fluctuate depending on genetics, lifestyle, cancer risk, human papillomavirus (HPV) infections, and sexual practices. We planned to understand the influence of Body Mass Index (BMI) on the vaginal microbiota of Hispanic women with varying degrees of HPV infection risk and cervical dysplasia.

METHODS: Cervicovaginal swabs were collected from 340 women as per IRB Streamlyne #2290033153. Samples underwent genomic DNA extraction for microbial assessment using 16S rRNA gene sequencing, following bioinformatic universal pipelines, and for HPV genotyping using LiPA25. Participants were characterized for their HPV risk type, cervical cytology, and BMI.

RESULTS: Women in this cohort were aged between 21-60 years old. Underweight women negative for intraepithelial lesions (NILM) and high-risk HPV (hrHPV+) infections demonstrated lower microbial diversity, while overweight women with low-grade lesions showed the highest diversity. Overweight individuals with high-grade lesions had increased levels of *Gardnerella*. Significant changes in microbiota diversity were found between normal weight with NILMhrHPV+ and obese women with low-grade lesions (p-value=0.047895). In women that shared CST IV, diversity increased in overweight compared to obese (p-value=0.004), while *Gardnerella* increased in the obese group.

CONCLUSION: Our findings underscore the significant role of cervical phenotype and HPV in shaping the microbiota, and that BMI can modulate diversity in those with similar CSTs.

Funding: This project was funded by the Research Education Program on Microbes, Infections and Cancer (REPMIC) R25AI183304-01, NIH Center for Collaborative Research in Minority Health and Health Disparities (RCMI) 2U54MD007600, NIH-NIGMS programs Alliance U54MD007587 and PR-INBRE 5P20GM103475-17.

THE CERVICAL MYCOBIOME AND ITS ASSOCIATION WITH HPV INFECTIONS AND CERVICAL LESIONS

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INTRODUCTION: While the cervicovaginal microbiome has been related to a higher risk of human papillomavirus (HPV) infections, which leads to high-grade squamous intraepithelial lesions (HGSIL) and cervical cancer, the factors causing its persistence remain unclear. Evidence suggests that the vaginal mycobiome and bacteriome composition, determined by Community State Types (CSTs), may play critical roles in disease progression. This study investigates how the cervical mycobiome varies with physiological state, HPV risk, and cervical lesions.

METHODS: Cervical swabs from 71 women were collected (IRB Streamlyne #2290033153) for genomic DNA extractions for HPV typing (LiPA25) and fungal identification with ITS-1 sequencing using Illumina MiSeq. Microbial assessment was performed using the UNITE database for taxonomic fungal assignments.

RESULTS: Pregnant women exhibited lower beta diversity dispersion at the genus level compared to menopausal and non-pregnant women ($p<0.010$). Fungal structure revealed that lesion negative samples have a more heterogenous inter-individual composition than HGSIL or low-grade squamous intraepithelial lesions (LGSIL) groups ($p<0.001$). CST-I showed lower inter-individual heterogeneity than CST-III and CST-IV ($p<0.001$). *Candida* and *Aspergillus* were more abundant in CST-III compared to CST-I. An unidentified fungal species group was significantly associated with high-risk HPV infections ($p=0.022$).

CONCLUSIONS: Cervical lesions and HPV risk significantly associate with the vaginal mycobiome, being *Candida* associated with a *Lactobacillus iners* dominant profile. *Candida* and *Aspergillus* associated with vaginal bacterial dysbiosis. Ongoing species-level analyses may help understand fungal-bacterial interactions and identify biomarkers for cervicovaginal disease progression.

Funding: This project was funded by the Center for Collaborative Research in Minority Health and Health Disparities (RCMI) 2U54MD007600, NIH-NIGMS programs Alliance U54MD007587 and PR-INBRE 5P20GM103475-17.

THE IMPACT OF HPV INFORMATION SOURCES AND KNOWLEDGE AMONG UNVACCINATED INDIVIDUALS IN PUERTO RICO

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INTRODUCTION: Human papillomavirus (HPV) is a common sexually transmitted infection worldwide. Despite the availability of effective vaccines, vaccination rates remain suboptimal in Puerto Rico (PR). Understanding how individuals receive and interpret information about HPV is crucial for improving vaccination uptake. This study aimed to evaluate the impact of different information sources on HPV knowledge among unvaccinated individuals in PR.

METHODS: A secondary analysis was conducted using data from a previous study published by us involving 166 unvaccinated individuals. Data on demographics, HPV knowledge, and information sources were collected through a survey. Chi-square tests and logistic regression analyses assessed the association between information sources and HPV knowledge. Approved by IRB (EMSJBIRB-9-2022).

RESULTS: The majority of participants were under 45 years old (59%) and college-educated (95%). A significant proportion (66%) demonstrated limited HPV knowledge. Information received from health professionals, internet sources, and peer-reviewed journals was significantly associated with higher HPV knowledge ($p<0.05$). In contrast, information from family, friends, television, newspapers, and social media did not significantly impact HPV knowledge. Yet, among individuals who are knowledgeable about HPV, only 19% are willing to be vaccinated, 7% may consider getting vaccinated, and 7% will not get vaccinated.

CONCLUSION: Our findings highlight the critical role of health professionals and evidence-based information sources in improving HPV knowledge among the population. Therefore, our results suggests that factors beyond knowledge acquisition, such as information interpretation, may significantly influence HPV vaccination decisions. Further research is needed to explore these factors and develop effective strategies to improve HPV vaccination rates.

CONTRACEPTION AND STERILIZATION SHIFT THE VAGINAL MICROBIOTA IN HISPANICS

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INTRODUCTION: Vaginal communities are simple microbiota habitats dominated by protective lactic acid bacteria. Prior studies suggest an alteration of the cervicovaginal microbiota associated with contraception and human papillomavirus (HPV) infections. This study assesses the impact of female sterilization and contraceptive use on the cervicovaginal microbiota of Hispanics living in Puerto Rico with cervical disease.

METHODS: A cohort of 237 women was recruited under the IRB Streamlyne #2290033153. Three categories for contraception were considered: female sterilization, hormonal and non-hormonal methods. Furthermore, cervicovaginal swabs were collected and characterized for 16S rRNA amplicon sequencing and HPV genotyping. Microbial assessment was performed downstream with QIITA, QIIME2, and MicrobiomeAnalyst.

RESULTS: This cohort ranged from ages 21-54 and was classified as: never used contraceptives (n=37), used any type of contraceptive (n=136), and sterilized (n=64). Beta diversity was significantly different in women who never used contraceptives and had high-grade lesions as compared to sterilized women who were negative for intraepithelial lesions and positive for HPV (p-value=0.0482). Among women who had high-grade squamous intraepithelial lesions (n=42), those who had never used any contraceptive had significantly higher levels of Shannon diversity when compared to women who used any type of contraception (p-value=0.0298). Significant differences in beta diversity were also observed between sterilized and non-sterilized women (p-value=0.001). Sterilized individuals had higher levels of *Lactobacillus iners* and lower levels of *Lactobacillus vaginalis* than the non-sterilized group.

CONCLUSION: These findings suggest that contraceptive use and sterilization status influence cervicovaginal microbial dynamics, potentially affecting susceptibility to cervical disease and HPV persistence.

Funding: This project was funded by the Research Education Program on Microbes, Infections and Cancer (REPMIC) R25AI183304-01, NIH Center for Collaborative Research in Minority Health and Health Disparities (RCMI) 2U54MD007600, NIH-NIGMS programs Alliance U54MD007587 and PR-INBRE 5P20GM103475-17.

CLINICAL AND SOCIODEMOGRAPHIC PROFILE IN HISPANIC PATIENTS UNDERGOING CERVICAL EXCISION DUE TO ALTERED CERVICAL PATHOLOGY AND HPV STATUS

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INTRODUCTION: Human papillomavirus (HPV) infection rates in Puerto Rico are 34%, higher than the 27% observed on the US mainland. Approximately 10% of infected women may develop conditions that increase their risk of cervical cancer. Cervical conization is an excisional procedure used to diagnose and treat high-risk HPV strains as well as cervical intraepithelial neoplasia. We aim to determine the clinical and sociodemographic profiles of individuals undergoing cervical excision due to HPV-related cervical changes.

METHODS: Retrospective data were acquired through electronic medical records (EMR). A descriptive analysis was done using Stata software. SJCH IRB approval no. 02112023.

RESULTS: 81 cases were selected, with an average age of 41 years and a predominance of premenopausal individuals (84%). 40% had a normal BMI, while 37% had a BMI ≥ 30. The loop electrosurgical excision procedure (LEEP) was the most used cervical biopsy technique. The average number of pregnancies, births, and abortions was 3.54, 2.68, and 0.79, respectively. Comorbidities such as hypertension (17%), diabetes (6%), and thyroid disease (5%) were less prevalent than expected. 52% of patients had a history of sexually transmitted infections, 19% reported alcohol consumption, and 15% were smokers.

CONCLUSION: Knowing the clinical and sociodemographic characteristics of patients needing cervical excision due to HPV-related pathology is crucial for enhancing prevention, early detection, and treatment strategies. Further research is required to investigate whether factors such as age, reproductive history, comorbidities, and lifestyle behaviors are associated with the persistence of cervical dysplasia and HPV positivity in our patient population.

CHANGES IN BODY WEIGHT AND BODY MASS INDEX IN HISPANIC ADULTS DURING COVID-19 PANDEMIC USING N3C DATA: A COHORT STUDY

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INTRODUCTION: The COVID-19 pandemic, particularly during 2020 with lockdowns, posed significant challenges to lifestyle and diet that may have exacerbated Hispanic obesity prevalence. The aim of the study is to assess the impact of pandemic on weight and body mass index (BMI) in Hispanic adults.

METHODS: This retrospective cohort study using the National COVID Cohort Collaborative (N3C) data (Jan. 2019 – Dec. 2023) from Hispanic adults in the U.S. for whom demographic and anthropometric data were available. BMI was calculated and categorized into six statuses (WHO): under-, normal-, over-weight, obese I, II and III. Paired/unpaired t test, McNemar-Bowker test and ANOVA were used.

RESULTS: The Hispanic cohort (n=12,131; age 21-84 years, mean 48.9±13.7) comprised predominantly female (64.9%) and overweight/obese (83.4%) participants before the pandemic. A characteristic pyramidal weight change pattern emerged, peaking in 2021, across almost all demographic strata. Distinct weight trajectories were observed: younger participants (<50 years) and those initially normal/underweight demonstrated continued weight gain, while older participants (>69 years) and obese II/III subjects exhibited progressive weight loss. Between 2019 and 2021, significant BMI transitions occurred ($p<0.001$), with 16.6% progressing to higher obesity classifications, 74.2% maintaining baseline status, and 9.1% switching to lower classifications; overall mean weight increased significantly from 80.8 to 81.3 kg ($p<0.001$), with the most pronounced gain among young adults (21-30 years; +2.56 kg) and initially underweight (+2.26 kg), contrasted by weight loss in obese II/III (-0.15 to - 0.77 kg) and older adults (60+ years: -0.31 to -0.48 kg); female gained more weight than male (0.6 vs. 0.3 kg, $p<0.001$). While racial differences approached significance (Blacks: +1.0 kg, $p=0.060$), no significant differences were observed by smoking status or mRFEI food environment groups (swamp, healthy).

CONCLUSION: Hispanics experienced significant weight gain during COVID-19 pandemic. Our findings highlight the need to explore weight-related lifestyle factors in Hispanics and develop more adaptive strategies to weight control.

Funding: NIH U54GM133807 and NIMHD S21MD001830.

IRB Approval: All N3C activities were approved by a central Institutional Review Board at John Hopkins University (Reliance Protocol IRB 00249128). We conducted analyses on the Level 2 de-identified N3C dataset to protect participants' privacy.

EMERGENCY DEPARTMENT AND HOSPITALIZATIONS FOR PEDIATRIC MENTAL HEALTH: ROLE OF SOCIAL VULNERABILITY IN COVID-19

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INTRODUCTION: The COVID-19 pandemic increased pediatric emergency department (ED) visits and hospitalizations for depression and anxiety. Social vulnerability, a community's ability to respond to public health emergencies may heighten this risk. We hypothesize that pandemic-related changes in pediatric mental health-related healthcare utilization will be influenced by social vulnerability.

METHODS: This is a retrospective cohort study using data from 519,550 children (3-17 years) with mental health-related visits at four time points (2019-2023). Visits were stratified by year, where t_0 pre-pandemic, t_1 pandemic peak, t_2 ongoing pandemic, and t_3 early post-pandemic period. We analyzed how the Social Vulnerability Index (SVI) relates to ED visits and hospitalizations at each time point, using electronic health records from the National COVID Cohort Collaborative (N3C).

RESULTS: Children were 53.4% girls, 82% non-Hispanics, 68% White, 17% Black/African American, with 55% aged 12-17. Based on SVI quartiles, 12% fall into Q1 (most vulnerable), 37% in Q2, 37% in Q3, and 14% in Q4. Anxiety (83%), ADHD (71%) and depression (49%) were the most common visit-related conditions. Pre-pandemic (t0), most vulnerable populations relied more on emergency care, a trend that intensified during the pandemic peak (t_1) but weakened later (t_2, t_3). By t_2 and t_3, higher SVI remained associated with increased visits.

CONCLUSION: Results suggest that social vulnerability significantly influenced ED mental health visits during the pandemic. Initially, most vulnerable children sought emergency care frequently, but this effect weakened post-pandemic. Findings highlight the role of social determinants in healthcare utilization and the need for targeted support in future crises.

Funding: NIH U54GM133807.

IRB Approval: This study involves the analysis of existing, secondary data that is publicly available and de-identified. As such, it does not involve interaction with human subjects nor identifiable private information.

STIGMA, MENTAL HEALTH AND SOCIAL SUPPORT IN PEOPLE DIAGNOSED WITH "MPOX" IN PUERTO RICO: DESCRIPTIVE PROFILE

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INTRODUCTION: From May 2022 to December 2024, the Puerto Rico Department of Health reported 265 confirmed cases of Mpox virus. Individuals diagnosed with Mpox may be at higher risk for social stigma, depression, anxiety, and lack of social support. These factors commonly lead patients to conceal their diagnosis, which in turn has increased health complications, as well as to experience stigma and symptoms of anxiety and depression. The main objective of this study is to analyze the characteristics of individuals diagnosed with Mpox, focusing particularly on experiences of stigma and mental health.

METHODS: An online survey was completed by participants diagnosed with Mpox in Puerto Rico. Survey included sociodemographic characteristics, an adapted HIV stigma scale for Mpox stigma, PHQ-4 scale (for depression and anxiety), and the MSPSS scale to measure perceived social support. Descriptive statistics were performed using SPSS.

RESULTS: The sample consisted of 41participants; (37 men, 4 women). Mean age of participants was 36.1 years. There was some social stigma related to Mpox (μ=20.9) documented. Depression and anxiety symptoms were categorized as mild (μ=3.0) according to PHQ4 Score. Perceived social support suggest high support among participants (μ=5.65).

CONCLUSION: Although some stigma, depression and anxiety were experienced, results show that participants received social support during their Mpox diagnosis. This may suggest a positive impact of social support on their emotional well-being, indicating that it could help minimize the mental health impact of the Mpox diagnosis. Future emerging public health strategies should consider social support as a key element in the response.

IRB Approval: The Office for the Protection of Human Subjects in Research of the Medical Sciences Campus approved all research activities in protocol #2301073590.

Recognitions: Study Participants.

ESCOBAR SYNDROME AND SCOLIOSIS: A REVIEW OF TREATMENTS AND CHALLENGES

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INTRODUCTION: Escobar Syndrome (ES) is a rare genetic disorder characterized by joint contractures, pterygia, craniofacial anomalies, and scoliosis. Scoliosis, affecting 32% to 93% of ES patients, is the most common skeletal anomaly, yet literature on its management remains limited. This study examines clinical presentations, radiographic parameters, spine characteristics, and surgical outcomes in ES patients with scoliosis.

METHODS: Institutional Review Board (IRB) approval was obtained from a single pediatric institution. A retrospective review of electronic medical records identified 21 patients with ES and scoliosis treated between 2000 and 2021. Data included demographic information, clinical features, and radiographic parameters (curve angles and intraspinal anomalies), treatment outcomes and surgical variables (procedure time, blood loss, and complications).

RESULTS: Of 21 patients (66% female), 61.9% were ambulatory. Craniofacial abnormalities (76%) and tethered cords (47%) were common comorbidities. Sixteen surgically treated patients showed significant improvement in mean Cobb angles (72° to 53°, p=0.0048). Untreated patients had an average Cobb of 54°. Surgical methods included growing rods, MAGEC rods, VEPTR, and posterior spinal fusion (PSF). VEPTR rods demonstrated the highest complication rate, with seven implant-related failures requiring frequent revision surgeries. Anesthesia-related complications occurred in 52.9% of cases.

CONCLUSION: Scoliosis in ES presents unique challenges due to associated anomalies and high complication rates. While surgical interventions effectively improve spinal alignment, VEPTR rods showed the highest complication rate and required further revisions, making them a less favorable option. Optimal outcomes in this complex patient population require a multidisciplinary approach for treatment selection and management.

IRB Approval: This study was reviewed and approved by the Institutional Review Board of Shriners Children's Philadelphia and was granted exemption status (IRB protocol #PH2404R).

BODY MASS INDEX IN PATIENTS WITH THE BARDET-BIEDL SYNDROME IN A LATINO POPULATION

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INTRODUCTION: Patients with the Bardet-Biedl syndrome (BBS) have a rare multi-systemic disorder with various clinical features including: retinitis pigmentosa; truncal obesity; polydactyly; learning disabilities; hypogonadism and hypogonadotropism. The syndrome is inherited in an autosomal recessive trait. At least 26 genes have been associated with the syndrome, with BBS1 being the most common. We report on the genotype-phenotype correlation between gene mutations and Body Mass Index (BMI) in 27 Latino patients with the BBS.

METHODS: After approval by IRB, we conducted a chart review of 27 patients with the BBS, who underwent a comprehensive evaluation by at least one of the authors (NI). Patients' weight and height were recorded to calculate BMI. Descriptive and statistical analysis were done.

RESULTS: There was equal distribution of obesity among male and female patients. In terms of BMI: 11.1% of patients had a normal BMI; 37.0% were overweight; and 51.9% were obese. Patients with mutations in *BBS1* gene had the highest frequency of obesity (78.6%). Compound heterozygotes and homozygotes showed distinct BMI patterns, with 21.4% of compound heterozygotes classified as obese.

CONCLUSION: Our findings show a strong correlation between *BBS1* mutations and obesity. Further studies exploring genotype-phenotype correlations are needed, to facilitate obesity treatments and improve outcomes in patients with the syndrome.

Funding: Supported in part by Invitae Corp. (mutational screening tests) and the Fundación de Retinitis Pigmentosa de PR.

BRIDGING CULTURE AND CARE: HOME-BASED PHYSICAL ACTIVITY INTERVENTION FOR OLDER LATINOS WITH TYPE 2 DIABETES

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INTRODUCTION: Type II Diabetes Mellitus (T2DM) is the third leading cause of death in Puerto Rico affecting 39.7% of older adults. Despite the proven benefits of physical activity (PA) in diabetes, 49% of Puerto Ricans with T2DM remain sedentary. This study explores the feasibility of an individualized, home-based PA protocol for sedentary older adults with T2DM using a descriptive qualitative design.

METHODS: The protocol, based on the Information-Motivation-Behavioral Skills Model, includes evaluation, education, training, program development, and supervised progression by a physical therapist. A focus group of experts (n=7) including geriatricians, exercise physiologists, geriatric physical therapists, and a diabetes educator explored their perceptions on its feasibility. Another focus group (n=3) and individual interviews (n=1) with sedentary older adults (≥65 years) evaluated their exercise knowledge, protocol perceptions, and preferences. Approved by the IRB, number 2405234620.

RESULTS: Experts recommended two weekly sessions for 12 weeks to promote adherence, emphasizing enjoyment over strict adherence to guidelines. They suggested incorporating family involvement and video resources. Older adults recognized PA benefits but faced barriers such as comorbidities (e.g., peripheral neuropathy), lack of knowledge, and the need for companionship. However, they had the time and space for home-based PA and were open to professional guidance.

CONCLUSION: A supervised home-based PA protocol was perceived as feasible for increasing PA in sedentary older adults with T2DM. Findings highlight key facilitators and barriers for Latinos with T2DM engaging in PA. Future research should assess the protocol's effectiveness in improving PA levels and adherence among this population.

Funding: Study supported (S21MD001830) by the NIH National Institute of Minority Health and Health Disparities.

DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF PATIENTS WITH ALZHEIMER'S DISEASE AND RELATED DEMENTIAS IN PUERTO RICO

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INTRODUCTION: As part of the study *Primary Care Transformation in Puerto Rico's Physician Organizations Following Hurricane Maria*, this analysis examines the characteristics of Medicare beneficiaries with Alzheimer's disease and related dementias (AD/ADRD) receiving care across different physician organization delivery models.

METHODS: Our cross-sectional study analyzed screening data from 51 patient-caregiver dyads recruited between February and June 2024 through the Alzheimer's Association of Puerto Rico, OPAPA and Federally Qualified Health Centers. Demographic, clinical, and healthcare utilization data were collected through structured interviews with patients and caregivers. Approved by UPR-MSC IRB Protocol # 2690122/Streamlyne 2311162366 and RAND IRB Protocol # 2021-N0674.

RESULTS: More than half (58.82%) of patients were female, most (60.78%) were ineligible for the Nutritional Assistance Program, and the highest level of education reported was a university degree (29.41%). Seventy-five percent had Alzheimer's disease, with severity categorized as mild (16%), moderate (53%), and advanced (31%). Most patients were enrolled in Medicare Advantage plans (94%), with 67% having dual Medicare-Medicaid eligibility. Common comorbidities included hypertension (59%), diabetes (33%), cardiovascular disease (29%), and arthritis (29%). Regarding care delivery, 50.98% lacked an assigned primary care provider, and 66.67% did not consider theirs as the primary source of Alzheimer's care, with 60.7% relying on neurologists. The data shows that 54.9% of participants received care from independent physicians, and healthcare visits typically occur every three months or less frequently (58.8%).

CONCLUSION: The study underscores the need for improved care coordination and tailored healthcare strategies to better support individuals with AD/ADRD and their caregivers in Puerto Rico, highlighting opportunities to strengthen primary care and specialist neurologist access for comprehensive health management.

Funding: U.S. National Institute of Aging, Grant R01AG075508.

Acknowledgement: Research reported in this publication was supported by the National Institute of General Medical Sciences of the National Institutes of Health under award number U54GM133807. A special thank you to the Biomedical Informatics, Bioinformatics and Cyberinfrastructure Enhancement Core (BiBEC).

IMPROVING CAREGIVER SUPPORT: A USER-CENTERED APPROACH TO MHEALTH SOLUTION FOR DEMENTIA CARE

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INTRODUCTION: Informal caregivers of patients with Alzheimer's and related dementias face significant challenges, including economic strain, psychological pressure, and health issues. This study aimed to use a user-centered approach to identify their needs and inform the design of an mHealth solution to support them.

METHODS: The literature in the topic was explored to identify challenges and gaps in caregiver support. An app discovery phase analyzed 31 caregiving apps from Google Play and the Apple App Store. Interviews were conducted with informal caregivers (n=15). Qualitative data was analyzed using Braun and Clarke's thematic analysis approach.

RESULTS: Preliminary findings from the literature review, caregiver interviews, and app analysis revealed significant gaps in caregiver support, including mental health, social isolation, lack of education, information, and resources. Caregivers expressed positive attitudes toward mHealth interventions but highlighted the need for support in caregiving and self-care. Of the 31 apps reviewed, only six targeted dementia caregivers, with key features like reminders and medication management, but lacked emotional support and educational tools.

CONCLUSION: While caregivers supported the use of mHealth interventions, available apps showed inconsistencies in quality, usability, and evidence-based content, emphasizing the need for standardized evaluation criteria. None of the reviewed apps were tailored for Latino Puerto Rican caregivers, indicating the need for culturally relevant, user-friendly solutions developed with input from healthcare professionals, educators, patients, and caregivers.

IRB approval: 2024030019 - Committee for the Protection of Human Subjects in Research at the University of Puerto Rico, Mayagüez Campus.

ASSOCIATIONS BETWEEN CHRONIC PHYSICAL HEALTH CONDITIONS AND STRESS-RELATED MENTAL HEALTH CONDITIONS

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INTRODUCTION: Hispanic/Latinx (H/L) sexual and gender minority individuals are at a higher risk of developing trauma-related mental health conditions (TRMHC) and chronic health conditions (CHC) due to intersecting factors like discrimination and social stress. However, there is a research gap regarding the relationship between these mental and physical health conditions, specifically between trauma-related mental health conditions among sexual and gender minority. This study aimed to compare disparities in the prevalence of TRMHC (e.g., Post-Traumatic Stress Disorder, Acute Stress Disorder, Adjustment Disorder) and CHC (e.g., cancer, cardiovascular conditions, diabetes) between H/L sexual and gender minority individuals and their heterosexual and cisgender counterparts.

METHODS: Retrospective secondary data from the All of Us Research Program database was used, focusing on participants identifying as H/L (n=75,210). Data was analyzed using the All of Us workbench's R environment.

RESULTS: When examining the disparities between TRMHC and CHC in sexual minorities among H/L, individuals who reported TRMHC are 2.57 times more likely to report CHC (OR = 2.58, 95% CI [1.53, 4.73], $p < .001$). In gender minorities among H/L, individuals who reported TRMHC are 1.80 times more likely to report CHC (OR = 1.80, 95% CI [0.052, 7.02], $p = 0.36$), however, this effect was not statistically significant.

CONCLUSION: These findings highlight significant associations between TRMHC and CHC, but also, disparities in this associations among sexual and gender minorities. While TRMHC strongly predicts CHC, the strength and significance of this relationship vary by sexual and gender identities, underscoring the importance of considering intersectionality in research.

Funding: The Biostatistics, Epidemiology & Research Design Core (BERD) of the The Hispanic Alliance for Clinical and Translational Research under the Award Number U54GM133807 from the National Institute of General Medical Sciences (NIGMS).

IRB Approval: PHSU (#2308162140)

AWARENESS AND KNOWLEDGE OF STROKE SYMPTOMS PRIOR TO A STROKE EVENT IN HISPANIC STROKE SURVIVORS IN PUERTO RICO

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INTRODUCTION: Stroke was the 5th leading cause of death in the United States (2019) and the 6th in Puerto Rico (2020). However, by knowing stroke symptoms, life-saving action can be taken to lessen the brain damage that stroke can cause. The objective of this study is to assess the knowledge of stroke symptoms prior to a stroke event in Hispanic stroke survivors in Puerto Rico and its impact on awareness of occurrence, driving force to go to hospital, initial medical management and outcomes.

METHODS: This is a descriptive cross-sectional study with a prospective convenience sample of adult Hispanic stroke survivors at HIMA San Pablo Primary Stroke Center. This study involves the use of a questionnaire administered to participants and medical record review.

RESULTS: Forty-one (41) participants (average age: 59 years) were recruited. 66% were men and 56% has educational level less than completed baccalaureate degree. Only 31% knew the stroke symptoms prior to the event, 22% recognized that a stroke event was occurring, but 76% said that having stroke symptoms was the main reason for seeking immediate care. 78% of strokes were ischemic. The average initial National Institutes of Health Stroke Scale score was 5.3.

CONCLUSION: The prevalence of symptoms knowledge and stroke awareness is low, but the consideration of a stroke event is the main reason for immediately seeking care. These findings may lead to the development of effective educational programs about stroke symptoms, its early identification, and the importance of arriving to the hospital immediately for care.

IRB Approval: This study was approved by the San Juan Bautista School of Medicine Institutional Review Board, Protocol #EMSJBIRB-21-2018.

MULTIDIMENSIONAL INSIGHTS INTO PUERTO RICAN LUPUS PATIENTS AND THEIR QUALITY OF LIFE

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INTRODUCTION: Systemic Lupus Erythematosus (SLE), commonly known as lupus, is a complex autoimmune disease with significant knowledge gaps in its prevalence and patient challenges in Puerto Rico. The most recent epidemiological data is outdated, highlighting the need for new research. Although the primary interest is to address the gaps in information specific to Puerto Rico, the survey was distributed across Latin America to provide a broader context, facilitate comparative analysis, and enhance the understanding of lupus trends in the region.

METHODS: This study aimed to distribute a multidimensional survey to the Latin American population, assessing key aspects of lupus patients' lives, including gender, maternity, medication usage, medical history, specialist visits, side effects, and healthcare access. Over five months, 62 responses from Puerto Rican lupus patients were collected. Statistical analyses focus on demographic trends, treatment accessibility, and barriers to care.

RESULTS: Preliminary data from the total survey responses (232) indicate that 223 (96.1%) were female, aligning with lupus' higher prevalence among women. However, it is important to note that studies have reported that women tend to participate in surveys more frequently than men, which could have influenced this high percentage. Many patients reported mental health challenges, yet few accessed specialized psychological care. Other findings highlight the need for improved healthcare access, specialized treatment, and greater lupus awareness among Puerto Rican healthcare providers.

CONCLUSION: Future work will focus on refining demographic data on lupus in Puerto Rico and expanding survey distribution to improve healthcare planning and support for lupus patients on the island.

ASSOCIATION BETWEEN THE AGE AT ONSET OF SYMPTOMS AND DIAGNOSTIC DELAY OF ENDOMETRIOSIS IN PUERTO RICO: A CROSS-SECTIONAL STUDY

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INTRODUCTION: Endometriosis is a condition that affects the quality of life during the most productive years. Disabling chronic pelvic pain, dysmenorrhea, dyspareunia, and infertility, are symptoms that can have a detrimental effect on a person's physical and mental state. We hypothesized that the age at which people experienced symptoms of endometriosis was associated with diagnosis delay. To quantify the mean time of diagnosis of endometriosis and to evaluate the association between the age at onset of symptoms and diagnostic delay were our objectives.

METHODS: A self-administered online survey was conducted from April to May 2024 among persons from "Fundación Puertorriqueña de Pacientes con Endometriosis" who had a diagnosis of endometriosis. Symptoms and diagnostic history were captured and summarized. Logistic regression analysis evaluated the association between age at onset of symptoms and diagnostic delay of endometriosis. Approved by IRB #2311166438.

RESULTS: The mean years of delay in diagnosis of endometriosis in Puerto Rico was estimated at 9 years among 133 participants. Individuals experiencing symptoms before the age of 20 were six times more likely to have a delay in the diagnosis of endometriosis (95% CI: 1.26, 29.55) when compared to individuals who began experiencing symptoms after 31 years.

CONCLUSION: Experiencing symptoms at a younger age increases the possibility of a delay in diagnosis. Important factors for this delay were: receiving treatment for symptoms and not being referred to a specialist. This highlights the importance of training pediatricians and other general practitioners about the symptomatology of endometriosis during adolescence and young adulthood.

Funding: This study was supported, in part, by RCMI-CCHD grant U54MD007600.

NUTRITIONAL PROFILE OF A SAMPLE OF ADULTS LIVING WITH HIV IN PUERTO RICO.

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INTRODUCTION: People living with HIV (PLWH) face numerous nutritional challenges, stemming from altered metabolism, malabsorption, and compromised immune function. Balanced diets play an important role in their well-being, preventing malnutrition and wasting syndrome, which is common in this population. Given limited existing data, we describe the dietary patterns of a sample of PLWH in Puerto Rico (PR).

METHODS: Data from an ongoing IRB-approved (IRB CCC 2411004947) cross-sectional study (May 2023-present) among PLWH ≥21 years was analyzed (n = 227). Biological samples were taken and a questionnaire regarding their nutrition, supplement intake, and sociocultural factors was administered. Nutritional questions assessed the frequency of intake across various food groups and micronutrients. Descriptive statistics and bivariate analyses by sex were performed.

RESULTS: Among demographics, 72% of participants were men, 67% reported an annual income < $20,000, and 50% had <12 years of education. Over two-thirds consume vegetables (70%) and fruits (65%) ≥ 4 times weekly and reported daily consumption of multivitamins (64.2%). However, more than half never consumed probiotics (52.2%) and omega 3/6/9 (64.2%). Furthermore, many consumed almost daily high amounts of pro-inflammatory groups, like dairy (51.3%) and starch-rich foods (42.9%). There was no significant difference ($p>0.05$) between the nutritional consumption of men and women.

CONCLUSION: Many PLWH in our study report favorable nutritional patterns for immune function, including proper intake of fruits and vegetables. However, the intake of probiotics and omega 3/6/9 should increase, and refined-grain, starch-rich foods could be reduced among them. Proper nutritional behaviors should continue to be promoted among PLWH.

Funding: This project is funded by the NIH institutes grants (R25AI183304-01 & 1R56DE032668).

EXPLORING DIAGNOSIS-TO-TREATMENT TIME IN PUERTO RICAN RENAL CANCER PATIENTS

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INTRODUCTION: The timely transition from diagnosis to treatment is crucial in renal cancer management to prevent disease progression. Puerto Ricans face unique healthcare challenges due to differences in insurance coverage, socioeconomic status, and healthcare access, when comparing individuals living on the United States (U.S.) mainland versus those in Puerto Rico (PR). The objective of this study is to assess the time from diagnosis to treatment (DTT) among renal cancer patients in Southern/Central PR.

METHODS: This study involved a retrospective secondary analysis of renal cancer cases using data from the Puerto Rico BioBank (PRBB) and corresponding medical records. Descriptive analyses were performed using SPSS version 28. The study received approval from the Institutional Review Board (#2310171592R001) of Ponce Health Sciences University.

RESULTS: We identified 50 renal cancer cases, with patients ranging in age from 24 to 84 years. The mean time for DTT was 167.94 days (SD: 139.57), with 39 patients (78%) experiencing a delay of ≥ 90 days. Among the cohort, 35 patients (70%) had private health insurance. The most common risk factors included hypertension 33 (66%), diabetes mellitus 13 (26%), and an average body mass index (BMI) of 30.50 (SD: 6.32). The mean age at diagnosis was 63.88 years (SD: 11.42).

CONCLUSION: The majority of renal cancer patients in Puerto Rico experienced significant treatment delays, with more than 78% waiting 90 days or longer for treatment. These findings underscore the need to address healthcare access challenges and potential disparities to improve timely cancer care in this population.

Funding: We acknowledge the U-54 PHSU-MCC Partnership-grant number(s) PHSU – U54 CA163071 and MCC– U54 CA163068.

SPATIAL DISPARITIES IN CRC MORTALITY: HOT AND COLD SPOTS IN PUERTO RICO (2000-2019)

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INTRODUCTION: Despite efforts to improve screening and early detection, colorectal cancer (CRC) remains a leading cause of cancer deaths in Puerto Rico (PR). This study analyzed 2000-2019 CRC mortality patterns to identify geographic hot spots (HS) and cold spots (CS), aiming to understand potential health inequities.

METHODS: Age-adjusted CRC Mortality Rate (MR) (2000-2019) for PR municipalities were obtained from PR Central Cancer Registry publicly available data. Spatial autocorrelation was assessed using the Getis-Ord Gi* statistic with queen contiguity spatial weights and Bonferroni correction. Municipalities were classified as CRC mortality HS or CS based on the Gi* statistic and adjusted p-values. Median age-adjusted CRC mortality rates between spots were compared using the Wilcoxon test. Analyses were performed using R (version 4.4.1) and R-Studio.

RESULTS: The analysis identified 12 CRC mortality HS: Adjuntas, Cabo Rojo, Ceiba, Fajardo, Guánica, Guayama, Guayanilla, Hormigueros, Lajas, Luquillo, Sabana Grande and San Germán. In contrast, there were 12 CRC mortality CS: Aguadilla, Aguas Buenas, Añasco, Bayamón, Lares, Las Marías, Manatí, Mayaguez, Moca, Rincón, San Juan and San Sebastián. HS had a 44% higher median CRC MR (17.7) than CS (12.3) ($p < 0.001$).

CONCLUSION: CRC mortality in PR is unequally distributed, with HS concentrated in the southwest and northeast, whereas CS are concentrated in the northwest and metropolitan areas, such as San Juan or Mayaguez, that are well-known for having better healthcare services. This disparity highlights the need to analyze sociodemographic factors to understand the causes of these differences to achieve health equity and reduce CRC mortality.

IRB Approval: This study utilized publicly available, de-identified data at the municipality level from the Puerto Rico Central Cancer Registry. Therefore, it was determined to be exempt from IRB review.

BREAST CANCER AND BEAUTY PRODUCTS USAGE: A PILOT STUDY AMONG PUERTO RICANS

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INTRODUCTION: Endocrine-disrupting chemicals (EDCs) could contribute to breast cancer risk because of their ability to alter hormonal actions. Breast cancer constitutes approximately 30% of the cancer diagnosed between 2016-2020 in Puerto Rico. This study aims to assess relationship between care and beauty product use and breast cancer among women living in Puerto Rico, and if sociodemographic factors have a modification effect.

METHODS: This ongoing case-control study (n=50) aimed to include a sample of 306 women aged 21 years and older who live in Puerto Rico. An interview- administered survey is being implemented to gather sociodemographic characteristics, cancer family history, and lifestyle characteristics, maternal health information and beauty products usage. Statistical analyses were used to describe usage patterns and association measures. All analyses were conducted using STATA. This study was approved by the UPRCCC IRB #2024-05-133B.

RESULTS: Most of our participants (60.8%) were >50 years old, were well-educated (78% > bachelor's degree) and over 56% had an income of $50,000 or more. Among our sample, 43.5% had a family member (mother, father, son, daughter, sister or brother) diagnosed with a type of cancer. The use of hair products (semi-permanent and highlights) at a young age (10-13 years old), as well as the recent use of mascara and hand cream was associated with breast cancer diagnosis.

CONCLUSION: Preliminary results show an association between the use of beauty products and breast cancer diagnosis among Puerto Rican women. Future studies should track EDC concentration among women who used beauty products to establish protective guidelines.

Funding: This project was supported by Award Number R25MD007607 from the National Institute on Minority Health and Health Disparities. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

CLINICAL TRIAL KNOWLEDGE AND SOCIAL DRIVERS OF HEALTH AMONG HISPANIC/LATINO AND BLACK CANCER SURVIVORS

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INTRODUCTION: Despite significant advancements in cancer treatment, differences in clinical trial (CT) participation persist, particularly among Hispanic/Latino (H/L) and Black women (BW). Social drivers of health (SDOH) can influence health outcomes and health care decisions, like CT participation. We assessed the association between SDOH and CT knowledge among H/L and BW cancer survivors in Puerto Rico (PR) and in Virginia, United States.

METHODS: This cross-sectional study included 150 H/L gastrointestinal (GI) cancer survivors from PR and 150 BW with breast/gynecological cancers from Virginia, aged 21+ years (Approved by IRB, protocol number: 2410003254). Participants completed an interviewer-administered questionnaire to assess knowledge and participation in CTs, and SDOH. Multivariate logistic regression models estimated the adjusted odds ratios (aOR) and 95% confidence intervals (CI) for CT knowledge.

RESULTS: Females accounted for 77.0% of the sample, and the mean age of study participants was 55±11.7 years. Most participants reported a higher educational attainment (76.3%), an annual income between $20,000 and $74,999 (38.8%), and having private health insurance (41.5%). While most study participants were aware of CTs (60.7%) and 80% had knowledge of CT, only 22.2% reported ever participating in a cancer-related CT. The aOR models showed that SDOH factors associated with CT knowledge were income, access to transportation, discrimination in medical settings, and perceived neighborhood social cohesion ($p<0.05$).

CONCLUSION: While CT knowledge was high, low CT participation was observed among our participants. Understanding factors that impact CT participation is important for developing targeted interventions to improve CT participation and health outcomes in these populations.

Funding: This research was supported by an AACR grant, Social Determinants of Health, Grant Number: 23-01-SDOH.

IRB Approval: This study was approved by the University of Puerto Rico Comprehensive Cancer Center Institutional Review Board (IRB-protocol number: 2410003254).

A CALL FOR ACTION: CANCER PATIENTS' PERCEPTIONS OF THEIR SOCIAL SUPPORTS AND BARRIERS IN PUERTO RICO

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INTRODUCTION: Cancer is one of the leading causes of mortality in Puerto Rico, representing not only a medical challenge; Its complexity includes social, economic, and cultural barriers that hinder access to quality healthcare. This study aims to understand the perception of cancer patients about their caregivers in Puerto Rico.

METHODS: This qualitative exploratory-descriptive study was approved by the Institutional Committee for the Protection of Human Subjects in Research (#2324-137). Data were collected through semi-structured interviews with nine cancer patients. The interview guide included 13 questions that explored various themes such as patient-caregivers' relationships, perceived effectiveness of support, challenges with caregivers, and healthcare system barriers. Audio recordings were transcribed and analyzed using the Perceived Social Support framework.

RESULTS: Sociodemographic findings revealed that 88.89% identified as female, 44.4% stated having a single caregiver, and 66.7% were diagnosed with breast cancer. Participants expressed a positive evaluation of the social support received from their caregivers and communities, highlighting its positive impact on their well-being. However, they mentioned facing multiple barriers, including disagreements with caregivers, discomfort with medical and administrative personnel, difficulties with insurance providers, inadequate healthcare infrastructure, geographic barriers, fragmentation in medical care, and limitations in information.

CONCLUSION: This study underscores the need to address these existing barriers and develop personalized intervention strategies through an interdisciplinary approach. It concludes by emphasizing the urgency of implementing public policies, training, and action programs that guarantee equitable access to quality services to mitigate disparities, strengthen social support, and promote the well-being of cancer patients in Puerto Rico.

DRIVERS ASSOCIATED WITH BARRIERS TO CANCER DIAGNOSIS AMONG CANCER SURVIVORS IN PUERTO RICO: RESULTS FROM START-PR

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INTRODUCTION: Between 2018-2022, 80,473 new cancer cases and 26,105 deaths were reported in Puerto Rico (PR). Despite efforts to facilitate cancer diagnosis, barriers continue to impact early diagnosis in patients in low- and middle-income countries. This study evaluated social and clinical drivers associated with barriers to cancer diagnosis among cancer survivors in PR.

METHODS: Data from START-PR, an ongoing cross-sectional study, was analyzed. Participants who completed an online survey between November 2023 and January 2025 (n=468) aged 21+ years, residing in PR, received cancer treatment within the past year, self-reported at least one barrier to cancer diagnosis. Differences in barriers to cancer diagnosis by social or clinical drivers were examined using Chi-square tests. Logistic regression models estimated adjusted odds ratios (aOR) and 95% confidence intervals (CI) for having at least one barrier to receiving a cancer diagnosis.

RESULTS: Eligible individuals were mainly aged 50+ years (79.3%), females (69.7%), and had an annual family income <$25,000 (58.8%). Approximately 31.2% of the participants reported at least one barrier to receiving a cancer diagnosis. Common barriers were health insurance problems (41.1%), financial issues (25.3%), and lack of communication with providers (24.0%). Adjusted regression models showed that predictors associated with receiving a cancer diagnosis included being unpartnered (aOR: 1.97, 95%CI: 1.29-3.00), low social support (aOR: 1.55, 95%CI: 1.03-2.36), and 2+ comorbidities (aOR: 1.67, 95%CI: 1.10-2.55).

CONCLUSION: Barriers at individual and organizational level affected cancer diagnosis in PR. Further research should develop tailored interventions to mitigate barriers that affect early cancer diagnosis in this population.

Funding: This study was partially supported by an award received by Bristol Myers Squibb.

IRB Approval: This study was approved by the IRB of the UPR Comprehensive Cancer Center (protocol # 2411004025).

QUALITY OF CARE RECEIVED BY CANCER SURVIVORS IN PUERTO RICO: INSIGHTS FROM THE START-PR STUDY

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INTRODUCTION: Quality of care (QOC) is defined as the degree to which health services increase the likelihood of desired health outcomes. It contributes to improving clinical effectiveness and patient safety. We aimed to assess the profiles of cancer survivors who report low QOC in oncology clinics.

METHODS: In this ongoing cross-sectional pilot study, we have recruited 589 individuals aged 21+ years who have received active cancer treatment within the past year and reside in PR. Participants completed an online survey that included questions on QOC (classified as low or high), sociodemographic characteristics, and clinical factors. Logistic regression models were performed to estimate adjusted odds ratios (aOR) and 95% confidence intervals (CI) between selected characteristics and QOC. Study approved by the UPRCCC-IRB (#24110025).

RESULTS: Most cancer survivors were women (70%), aged 50+ years (78%), had an annual family income < $25,000 (60%), and had localized cancer (64%). About 8.3% of the individuals reported a low QOC. For sociodemographic factors, those with an annual family income ≥ $25,000 (aOR: 2.10; 95%CI: 1.00,4.42), non-heterosexuals (aOR: 4.06; 95%CI: 1.50, 10.99), and unpartnered (aOR: 3.25; 1.49, 7.10) had higher odds of reporting low QOC. For clinical factors, cancer stages were associated with QOC ($p<0.05$).

CONCLUSIONS: While 91.7% of cancer survivors reported high QOC, our study suggests that cancer survivors with lower incomes, non-heterosexuals, and without a partner may experience differences in QOC, potentially leading to poorer health outcomes and satisfaction. Qualitative research is recommended to better understand the experiences of cancer patients in clinical settings.

Funding: This study was partially supported by Bristol Myers Squibb.

UNDERSTANDING BARRIERS AND FACILITATORS TO CERVICAL CANCER CARE AMONG WOMEN LIVING WITH HIV IN PUERTO RICO

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INTRODUCTION: Social determinants of health (SDoH) are well known to have an impact on cancer outcomes. There is no consensus on which SDoH might significantly affect access to cervical cancer care among women living with HIV (WLWH). This qualitative study aims to identify multilevel factors within SDoH that affect timely care for cervical cancer according to healthcare providers.

METHODS: In-depth interviews of 25 key informants (KI) are being used to identify/understand SDoH that may facilitate or prevent access to cervical care throughout the cancer continuum (prevention, diagnosis, and treatment) for WLWH. KIs were eligible if they were 21 years or older, lived in Puerto Rico, and had worked in an organization that provides cancer or HIV services for at least a year. A thematic content analysis was used to identify key themes using NVivo.

PRELIMINARY RESULTS: To date, 19 of 25 KI were interviewed; most of them were women (84.2%), medical providers (52.6%) and worked in HIV clinics (52.6%). Major themes highlight that education, longitudinal HIV care, and patient navigation services were identified as facilitators to cervical cancer care, whereas health insurance, stigma, patient commitment, and lack of transportation were identified as barriers.

CONCLUSION: Our study highlights key facilitators and barriers to cervical cancer care in WLWH. Given the high risk of cervical cancer in WLWH, addressing barriers to healthcare is crucial to improving cancer outcomes in this population. The data obtained in this project will inform multilevel health interventions in SDoH to improve access to cancer care in WLWH.

Funding: This project was supported by the National Institutes of General Medical Sciences (NIGMS) through the award grant number #P20GM148324.

IRB Approval: UPRCCC IRB Protocol 2411004755.

HEALTHCARE UTILIZATION DISPARITIES AMONG WOMEN WITH CERVICAL CANCER: THE ALL OF US RESEARCH PROGRAM

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INTRODUCTION: Despite the decline in cervical cancer rates, underserved populations face disparities. This study aims to investigate healthcare utilization among Hispanic, Black, and White women with cervical cancer.

METHODS: Utilizing the All of Us Research Program database, the study includes women diagnosed with malignant tumors of the cervix using ICD-10-CM codes C53 and D06, identifying as women and either Black, White or Hispanic. Participants completed surveys assessing overall health, healthcare access and utilization, personal and family health history, and social determinants of health were selected. Data analysis included descriptive statistics, univariate and multivariable logistic regression models. Key variables included delays in seeking healthcare due to limited time-off, caregiving responsibilities, transportation, and financial constraints. Data was analyzed using RStudio Cloud Environment within All of Us Workbench.

RESULTS: Among the 1,234 cancer patients, 299 (24.2%) identified as Hispanics, 670 (54.3%) as non-Hispanic White, and 265 (21.5%) as non-Hispanic Black. 794 (64%) attended college. Significant associations were found between race and income (p-value<0.001), healthcare delays due to transportation (p-value <0.001), child caregiving responsibilities (p-value < 0.001), and copayments (p-value <0.01). Most participants (95%) had insurance with 43.8% reporting annual earnings below $50,000. Participants earning $25,000 or less compared to those earning $200,000+ identified transportation access as a significant barrier to healthcare (OR=11.7 [95% CI: 2.3-212.9]), increasing to 12.2 [95% CI: 2.4-224.3] when adjusted by race.

CONCLUSION: Income, transportation and caregiving influence healthcare-seeking behavior among low-income women diagnosed with cervical cancer. Race/ethnicity modifies multivariate analyses. Further investigation into social determinants of health is essential.

IRB Approval: The research conducted using All of Us data is governed by a single Institutional Review Board (IRB) to ensure ethical oversight and compliance for all researchers accessing the dataset.

UNVEILING ORAL HEALTH TRENDS: PREVALENCE AND INSIGHTS FROM THE ALL OF US RESEARCH PROGRAM DATABASE

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INTRODUCTION: The integration of large-scale clinical databases has transformed health research. Among them, the All of Us Research Program stands out for its secure, cloud-based Researcher Workbench, offering comprehensive data from surveys, genomic analyses, electronic health records, physical measurements, and wearable devices. Despite the extensive scope of this resource, its application in oral health research remains underexplored.

METHODS: This study utilizes the All of Us database to characterize data related to common oral conditions, including dental caries, periodontitis, and gingivitis. We conducted prevalence analyses based on demographic and socioeconomic factors such as ethnicity, age, economic status, food security, healthcare access, and geographic location.

RESULTS: Data on dental caries includes 18,580 individuals (5.24%), with over 10,000 cases detailing specific complications. Gingivitis data comprises 6,480 participants (1.83%), with 4,180 chronic and 1,640 acute cases. Caries and gingivitis were more prevalent among women aged 30-60. Periodontitis was identified in 6,700 participants (1.89%), with nearly 8,000 cases of related complications. Prevalence was evenly distributed between females (3,400) and males (3,180), with a higher occurrence in individuals aged 50–69.

CONCLUSION: The All of Us Research Program offers a robust, harmonized dataset enabling population-level analyses of oral health conditions that were previously unattainable. Although oral health data represents a fraction of the database, the sample sizes are substantial for meaningful analysis. Future studies will incorporate local Puerto Rican data to compare prevalence rates between Hispanics living on the island and the mainland, enhancing the cultural and regional relevance of our findings.

IRB Approval: The IRB Office reviewed the request and determined that using All of Us “Controlled Tier” data does not constitute human subjects research under 45 CFR 46. Therefore, individual projects using this data do not require IRB review or approval.

FROM COMMUNITY TO RESEARCH: COMMUNITY-BASED STRATEGIES TO ENGAGE PUERTO RICANS IN THE ALL OF US RESEARCH PROGRAM

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COSSMA, Inc.

INTRODUCTION: The *All of Us* Research Program (AoURP) aims to recruit one million or more people, including historically underrepresented groups, to advance precision medicine. NIH/MITRE has partnered with Federally Qualified Health Centers. The COSSMA AoURP team utilized community-based approaches to increase Puerto Rican participation in biomedical research.

METHODS: Approved by AoURP IRB (2016-05), the COSSMA team attended health fairs and community activities organized by community leaders. They set up informational booths to educate attendees on the importance of participation and representation in biomedical research and invited them to join the program. Observations were documented after the events.

The team collaborated with community leaders to build trust and form a Community Advisory Board (CAB) composed of members from the communities and academics. CAB meetings focused on developing culturally appropriate outreach approaches. Additionally, the team partnered with the National Alliance for Hispanic Health (NAHH) and the University of Puerto Rico of Humacao (UPRH) to refer community members to COSSMA.

RESULTS: In 2024, the team participated in 7 community events, engaging 249 people. Of those, 68 provided contact information, and 28 enrolled in the program. A total of 22 participants were referred from NAHH and UPRH, with 10 enrolling. Feedback from Research Assistants indicated that community events increased accessibility and diversity, and collaborations with trusted organizations helped build credibility.

CONCLUSION: The COSSMA team successfully engaged underrepresented populations in biomedical research by utilizing community-based approaches, highlighting the potential of such strategies for future research.

Funding: U.S. Department of Health and Human Services Contract #75FCMC23D0004.

ENGAGING RURAL COMMUNITIES IN PUERTO RICO TO ASSESS HEALTH USING COMMUNITY BASED PARTICIPATORY RESEARCH

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INTRODUCTION: Using a community-based participatory research (CBPR) approach, the Puerto Rico Community Engagement Alliance (PR-CEAL) partnered with Castañer General Hospital to assess the health status of rural communities in Lares-Castañer, Jayuya, and Adjuntas. This study examined key health indicators, identified healthcare needs related to chronic conditions and mental health, and aimed to support community-driven public health strategies.

METHODS: A total of 110 patients were recruited based on availability while receiving care at the hospital and two affiliated clinics in Adjuntas and Jayuya. The Common Survey 3 was administered face-to-face using the REDCap platform to assess demographics, chronic conditions, and mental health status. Descriptive analysis summarized key health indicators.

RESULTS: The sample was predominantly female 70.9%, (n=78) with an average age of 43.3 years. 25.5% had at least one chronic condition, with hypertension 26% (n=29), asthma 24.8% (n=27), and type II diabetes 12.4% (n=14) being the most common. Despite this burden, only 26.4% received treatment, mainly with medication (17.3%) or a combination of medication and counseling (7.3%). 12.7% reported that their condition limited their daily activities. Mental health concerns were prevalent: 24.5% (n=27) reported lack of interest in activities, 19.1% (n=21) felt depressed, and 34.5% (n=38) experienced anxiety, making it the most reported.

CONCLUSION: These findings highlight the need for integrated healthcare interventions in rural communities to address both chronic disease management and mental health support. Expanding access to preventive care, treatment adherence programs, and mental health resources is essential for improving health outcomes in underserved populations.

Funding: This research was supported by a grant from the National Institutes of Health from the Puerto Rico Community Engagement Alliance Against COVID-19 Disparities (PR-CEAL) (OT2HL161827) and the Hispanic Alliance for Clinical and Translational Research (The Alliance) with support from the National Institutes of Health of the National Institute of General Medical Sciences (NIGMS-U54GM133807).

IRB Approval: This study was approved by the University of Puerto Rico Medical Sciences Campus Institutional Review Board (IRB), Protocol (A9360118), (A7080121).

BRIDGING GAPS IN HOME AND COMMUNITY-BASED SERVICES: INSIGHTS FROM THE PUERTO RICO MFP RAPID NEEDS ASSESSMENT

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INTRODUCTION: Puerto Rico's aging population faces significant healthcare and social support challenges. The Money Follows the Person (MFP) Rebalancing Program aims to transition individuals from institutional settings to home and community-based services (HCBS). This study conducted a rapid needs assessment to evaluate the long-term services and supports (LTSS) needs of elderly adults in Puerto Rico.

METHODS: A mixed-methods approach was employed. A non-probabilistic maximum variation sampling approach was used to select 201 participants (aged 60+) from multiple municipalities. A semi-structured survey captured sociodemographic, health, activities of daily living (ADL), instrumental activities of daily living (IADL), and LTSS needs data. Qualitative data from two focus groups (n=30) was thematically analyzed to identify barriers and facilitators to HCBS access.

RESULTS: Most respondents were female (64.7%) with an average age of 75.1 years. Nearly all (95%) reported at least one chronic condition, primarily hypertension (63.6%) and diabetes (42.2%). Balance loss affected 56.7%, and 42.8% experienced falls. Low income was prevalent, as 72.1% earned under $15,000 annually, limiting healthcare access. Transportation challenges impacted 59.2%, while 87% preferred home-based care. Economic hardships, social isolation, and caregiver stress were critical concerns. Family networks played a key caregiving role, yet caregivers faced high stress and burnout, emphasizing the need for expanded home and community-based services.

CONCLUSION: Findings underscore the necessity for policy-level interventions, including HCBS expansion, provider incentives, and regulatory adjustments to strengthen service delivery. A multi-sectoral approach is essential to ensure equitable access to LTSS.

Funding: Supported by CMS MFP Grant. Award Number: 1LICMS3318778.

IRB Approval: In accordance with 45 CFR § 46.104(5), this study is exempt from IRB review.

USING IMPLEMENTATION SCIENCE TO ADAPT A HEALTHCARE MANAGER INTERVENTION FOR PEOPLE WITH SERIOUS MENTAL ILLNESS IN PR

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INTRODUCTION: People with serious mental illness (SMI) die earlier than the general population, mostly due to preventable chronic diseases. Puerto Ricans in the Caribbean archipelago experience high rates of SMI, chronic diseases and the collapse of the healthcare system (e.g., limited infrastructure, personnel and fragmented services). Healthcare manager interventions (HMI) can be helpful in improving the physical health of people with SMI and address some of the contextual challenges and needs of healthcare settings. Unfortunately, HMI are not routinely used in the context of Puerto Rico (PR). The objective of this study was to adapt and preliminary test an HMI entitled Bridges to Better Health and Wellness (BRIDGES) in PR.

METHOD: We used two Implementation Science frameworks to conduct the intervention adaptation and implemented a single group pre-posttest design (n=17) to preliminary test the adapted BRIDGES in several outcomes: 1) receipt of preventive primary care services, 2 clinical and serum markers (i.e., cholesterol) and 3) implementation outcomes (i.e., acceptability). We conducted descriptive and repeated measure of variance (ANOVA) to examine the study outcomes.

RESULTS: Findings suggest that the most adaptations were unplanned (i.e., graduate psychology students as implementers) and at the surface level (i.e., language). Preliminary findings suggest that the receipt of preventive primary care increased significantly from 44.5 at baseline to 70.5. at 12-months ($p < .001$) and that some clinical markers (i.e. systolic and diastolic blood pressure) improved after 12-months.

CONCLUSION: All participants found the intervention is acceptable. Future studies with larger samples are needed to determine BRIDGES effectiveness.

Funding: U54MD007579.

IRB Approval: Ponce Health Sciences University (#2108071569A001).

INCORPORATING MEDICATION THERAPY MANAGEMENT AND PHARMACOGENOMICS INTO A RURAL INTERDISCIPLINARY PROGRAM

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INTRODUCTION: Pharmacogenomics (PGx) has the potential to revolutionize medication management by tailoring drug therapy to individual genetic profiles. However, the integration of Medication Therapy Management (MTM) with PGx in rural healthcare settings remains underexplored. This study aims to implement and assess the impact of PGx-guided MTM services in an interdisciplinary rural health program at Castañer General Hospital in Puerto Rico. This study aims to evaluate patient satisfaction with pharmacist-led MTM services, measure the clinical utility of PGx testing in optimizing medication therapy, and assess its impact on medication-related problems (MRPs) among patients with chronic conditions.

METHODS: A pilot study was conducted on 51 adults aged 55 and older receiving care at Castañer General Hospital. Pharmacists performed MTM consultations, collected buccal DNA samples for PGx testing. Also, it will provide tailored medication recommendations based on genetic results. The study will compare MRPs identified before and after PGx testing to evaluate its clinical impact. Data collection will include demographic information, patient satisfaction surveys, and medication-related outcomes, analyzed using descriptive and regression models.

RESULTS: PGx-guided MTM is expected to reduce MRPs, increase prescriber acceptance of pharmacist recommendations, and improve patient adherence. Additionally, high patient satisfaction with pharmacist interventions is anticipated, reinforcing pharmacists' role in personalized medicine.

CONCLUSION: Integrating PGx testing into MTM services in rural health settings can enhance medication safety, improve therapeutic outcomes, and promote the pharmacist's role in individualized patient care. This study may serve as a model for expanding PGx applications in underserved populations.

Funding: Hispanic Alliance for Clinical and Translational Research (Alliance).

IRB Approval: 2311166458.

DEVELOPMENT OF A CULTURALLY INFORMED ASSISTIVE DEVICE CONVERSATIONAL AGENT FOR OLDER LATINOS WITH DISABILITIES

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INTRODUCTION: Older adults in Puerto Rico experience higher rates of functional disabilities (FDs) compared to those in the continental US, increasing their risk of losing independence. While assistive technology (AT) can enhance daily function, Hispanic populations often underutilize these resources due to a lack of awareness. In partnership with TecnoAbuelos, we aim to develop a culturally tailored conversational agent (CA) to provide AT guidance for Hispanic older adults with FDs.

METHODS: Using design thinking and a human-centered approach, we designed and developed the CA proof of concept. The study included five cognitively intact Hispanic adults (≥65 years) with physical FDs residing in Puerto Rico and two AT service providers. Data from individual interviews were analyzed using directed content analysis.

RESULTS: Qualitative findings revealed eight major themes regarding the design of the AT CA: Acceptability, User Interface, CA Personality, Search Type, and Modality for receiving AT information.

CONCLUSION: Preliminary results indicate a positive reception of the proposed CA among older Hispanics and AT service providers. Our findings emphasize the importance of culturally tailored communication assistants in improving AT access. Key features, including voice interface, personalized preferences, and informative audiovisual content, are being incorporated to enhance autonomy and AT utilization among older Hispanics in Puerto Rico, ultimately addressing health disparities in FDs.

Funding: This research was supported by the National Institutes of Health (NIH) Agreement NO. 1OT2OD032581-01 and partially supported by the Alliance-NIGMS U54GM133807, and HiREC-NIMHD S21MD001830.

IRB Approval: This study was approved by the UPR-MSC IRB (protocol #2311160071).

DETERMINING FACILITATORS: OVERCOMING BARRIERS TO ASSISTIVE TECHNOLOGY USAGE AMONG HISPANICS

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INTRODUCTION: Assistive technology (AT) can significantly enhance the quality of life for individuals with disabilities by promoting independence, safety, and community participation. Research shows that Hispanics with disabilities face unique barriers that limit their access to healthcare services, including AT. However, there has been limited attention to the factors that facilitate AT usage in Hispanic communities, which is the aim of this study.

METHODS: This study employed a descriptive qualitative research design guided by the Social Ecological Model (SEM) to explore the multilevel facilitators for AT use. Thematic analysis was conducted on data gathered from nine in-depth interviews. To ensure trustworthiness, the study utilized data and investigator triangulation, member checking, and inter-coder reliability. Additionally, theme frequency counts were calculated based on how many participants mentioned each theme.

RESULTS: Facilitators for AT use were identified across all four SEM levels. Participants indicated that providers' knowledge of AT and the quality of access to services at the community level were critical factors influencing AT usage. Other facilitators included positive perceptions of AT (relationship level) and the improvements in performance and independence gained from using AT (individual level).

CONCLUSION: Participants emphasized the need to increase awareness of AT within the Hispanic community. Factors facilitating AT use are interconnected, with access to AT services and provider knowledge being the primary drivers. This study lays the groundwork for future community capacity-building sessions to enhance awareness and knowledge among community providers and members, ultimately increasing access to AT.

Funding: The study received partial support from two internal departmental awards.

IRB Approval: The study was approved by the Institutional Review Board of the University of Illinois at Chicago (#STUDY2020-1156).

VOICES AND STORYTELLING AS TOOLS TO ELEVATE LATINX SCIENTIST DURING THE PANDEMIC AND BEYOND

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INTRODUCTION: Science communication (SciComm) is a crucial tool for educating the public about science-related topics and sharing the stories of scientists and their careers. Unfortunately, many SciComm initiatives are not inclusive or multilingual, leading to a lack of representation of diverse communities in science, technology, engineering, arts, and mathematics (STEAM). During crises like the COVID-19 pandemic, this absence of inclusive, multilingual communication can fuel the spread of misinformation, disproportionately affecting underserved communities. For example, the lack of LatinX inclusion in SciComm efforts posed a challenge for Latin American communities during the pandemic.

METHODS: Our preliminary data revealed that only a small number of LatinX scientists are interviewed for the most popular science podcasts, blogs, videos, and other platforms. To address this gap, a Spanish SciComm platform called "Caminos en Ciencia" has worked to amplify the voices and stories of LatinX scientists, fostering a sense of community among them. In 2020, Caminos en Ciencia conducted interviews and discussions with LatinX scientists worldwide to educate the public about COVID-19, helping to reduce misinformation across Latin America.

RESULTS: Our data demonstrated an increase in global engagement with "Caminos en Ciencia" along with a growth of Spanish SciComm initiatives during the COVID-19 pandemic. This study showed that the COVID-19 pandemic further increased the engagement of Latin American communities with LatinX scientists through these informative and educational science conversations.

CONCLUSION: In conclusion, elevating the voices and stories of LatinX scientists is needed to recognize their work and contributions to science during the COVID-19 pandemic, while inspiring the next generation.

IRB Approval: N/A. The study did not conduct interviews or use any data from interviewees.

RECINTO PA' LA CALLE: PROTOCOL FOR A STUDENT-LED SYRINGE EXCHANGE

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INTRODUCTION: Recinto Pa' La Calle (RPC) is a harm reduction collective composed of students from the University of Puerto Rico's Medical Sciences Campus. Since 2011, RPC has provided essential services to people who use drugs (PWUD) and people experiencing homelessness. Faced with the need to expand services, RPC developed a protocol for the first student-led syringe exchange program on the archipelago. This abstract aims to describe the protocol's development for potential applications in other universities.

METHODS: Input was gathered from the organizations Gua' Kia and Iniciativa Comunitaria, along with a review of local public policy. Based on this information, evaluation indicators, a logic model, and incident management measures were defined. An evaluation component with clear, measurable indicators was also integrated to monitor the program's success and ensure sustainability and replicability.

RESULTS: The protocol establishes the following measurable objectives: 15% reduction of PWUD participants reporting risky behaviors (sharing or reusing syringes) after participating in the program, to impact at least 50 participants in 2025, and collecting at least 80% of distributed syringes to ensure a reduction in biological waste in public spaces. These evaluations will allow for continuous monitoring to ensure program effectiveness and impact.

CONCLUSION: This protocol will establish a new, valuable service in RPC and can pave the way for other student organizations interested in harm reduction initiatives. The multisectoral development of the protocol highlights student organizations' abilities to promote effective public health solutions at the community level.

IRB Approval: This study does not require IRB review, as it does not involve human subjects research.

UNMASKING BIAS AND RELIABILITY ISSUES IN ARTIFICIAL INTELLIGENCE: A STUDY ON IMAGE BASED DIAGNOSTIC ACCURACY

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INTRODUCTION: The use of Artificial Intelligence (AI) in medical diagnostics, particularly in image interpretation, has the potential to revolutionize clinical practice. This study investigates the diagnostic accuracy of GPT-4 and GPT-4o in identifying spinal pathologies, such as spondylolisthesis and lumbar disc herniation, from sagittal MRI images.

METHODS: This IRB approved study conducted a retrospective analysis of 60 de-identified MRI images divided into two experimental cohorts (spondylolisthesis and lumbar disc herniation), and one control image with normal spinal anatomy. GPT-4 and GPT-4o were tasked with providing a diagnosis and a self-generated confidence score for each image. Images were analyzed under standardized conditions, reducing bias and ensuring uniformity.

RESULTS: Both GPT-4 and GPT-4o showed a significant bias toward diagnosing lumbar disc herniation across all cohorts including the control image. No significant association between image type and diagnosis for either model was detected. The models "identified" lumbar disc herniation in 76.7% and 83.3% of control images for GPT-4 and GPT-4o, respectively and provided similar proportions for the experimental cohorts. Additionally, no significant correlation was found between the self-generated confidence scores and diagnostic accuracy.

CONCLUSION: These findings emphasize significant limitations in AI's current abilities to accurately distinguish between different diagnosis when based on image-containing prompts. The uncovered bias, combined with the disconnect between confidence scores and diagnostic accuracy, challenges the reliability of these models in real-world settings. Further research and refinement are necessary to address these biases and improve the diagnostic utility of commercially-available AI in the field of medicine.

Funding: N/A.

IRB Approval: This study was conducted in accordance with guidelines and protocols approved by the Institutional Review Board at Ponce Health Sciences University (Protocol #2404192441).

PERSPECTIVES OF MEDICAL STUDENTS AND PHYSICIANS ON ARTIFICIAL INTELLIGENCE IN RADIOLOGY

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INTRODUCTION: Artificial Intelligence (AI) systems can independently make decisions in various scenarios, such as image recognition and protocol optimization in radiology. While AI offers potential benefits, it also raises concerns about job security, data privacy, and patient confidentiality. This study explores Puerto Rican physicians' and medical students' familiarity with, trust in, and ethical concerns regarding AI in radiology. The goal is to identify strategies for integrating AI education into medical training to ensure responsible use and equitable healthcare.

METHODS: A cross-sectional survey assessed medical students' and physicians' perspectives on AI in diagnostic radiology. Conducted over four weeks in 2025, participants were recruited in person, with informed consent obtained. Quantitative data were analyzed using descriptive statistics and chi-square tests. The Institutional Review Board at Centro Medico Episcopal San Lucas approved the study.

RESULTS: Among participants (mean age 28.59), 52% were female, and 53% were medical students. While 95.5% had used AI, only 53.9% applied it in their work. Most found AI useful (95.5%) and were interested in learning more (88.8%). However, only 14.6% had received AI education. Perceptions varied, with 41.6% believing AI could be accurate for imaging diagnosis, while 58.4% did not. Lastly, the main concern of participants is over-reliance on AI (80.9%) for imaging diagnosis.

CONCLUSION: Based on this study, most participants lack formal education on AI's applications in radiology. However, the majority are willing to learn more, highlighting the need for education. Incorporating AI into medical education could enhance current perceptions, increase acceptance of AI's use for image diagnosis and address ethical concerns.

CHATGPT AS A RESEARCH ASSISTANT: BENEFITS AND CONCERNS AMONG UNIVERSITY STUDENTS

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INTRODUCTION: ChatGPT is an artificial intelligence (AI) system designed to interact and respond to questions in a conversational manner. This tool has multiple applications in academic and research contexts. However, due to its recent integration into educational settings, there is still limited research in Puerto Rico on how students utilize this technology.

METHOD: A descriptive study with a mixed-methods approach (quantitative and qualitative) was conducted to analyze how students use ChatGPT. The quantitative phase included 227 university students, while the qualitative phase involved 16 students. This study was approved by the Institutional Review Board (IRB) of the University of Puerto Rico, protocol 2324-145.

RESULTS: Participants reported using ChatGPT for academic support tasks that are transferable to research processes, such as idea generation, document writing, literature review, and information analysis. However, they also expressed concerns regarding the accuracy of the information provided by the AI, ethical considerations, and the risk of cognitive dependency on the application. These findings were analyzed within the framework of distributed cognition, which acknowledges the interaction between human cognitive processes and technological tools.

CONCLUSION: The results of this study suggest that ChatGPT can be a resource that complements and enhances knowledge production, provided it is used critically and ethically. Further research is needed to explore strategies to maximize the benefits of these tools in academic research.

AN OVERVIEW TO UNDERSTAND THE INTENTION TO COMPLETE RETENTION ACTIVITIES FOR ALL OF US RESEARCH PROGRAM AT UPR-COMPREHENSIVE CANCER CENTER

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INTRODUCTION: The All of Us Research Program (AoURP) aims to collect health data from one million people in the United States and its territories to accelerate research and contribute to precision medicine. By December 2024, the University of Puerto Rico Comprehensive Cancer Center (UPRCCC) had recruited 3,271 participants. Each participant is required to complete at least four surveys or more over a period of no more than 18 months to maintain prospective participation in the program and classify the effort as active retention. According to AoURP, the average retention rate for participants in research programs is less than 40%. This work aims to identify the intention and efforts in retaining participants at UPRCCC.

METHODS: By evaluating the database of recruitment efforts, quantitative analysis was conducted to describe the sample and identify efforts associated with achieving active retention. Of the 3,271 active participants, 1,042 were excluded because they had completed 8 or more surveys.

RESULT: Of the 2,229 participants contacted, 71% are women and 40% reported being 60 years or older. Around 60% of the participants responded the retention call, and over 75% of them requested an email with the surveys' information to do by themselves, and only around 15% requested a personalize help to continue retention activities.

CONCLUSION: These findings will help identify or adapt retention strategies based on the population of interest in Puerto Rico.

Funding: This project was supported by National Institutes of Health grant numbers OT2OD037907, awarded to SouthEast Enrollment Center, of which UPRCCC is part of.

HEALTH DISPARITIES INFLUENCING QUALITY OF LIFE AND HEALTH CARE UTILIZATION IN A U.S. FQHC

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INTRODUCTION: Social determinants of health (SDOH) significantly influence health outcomes and healthcare utilization, particularly among underserved populations. This study examines how key SDOH factors, including socioeconomic status, employment, and insurance coverage, impact healthcare utilization and quality of life among patients at a Federally Qualified Health Center (FQHC) in Erie, Pennsylvania. Understanding these associations can inform targeted interventions aimed at reducing health disparities and improving patient outcomes.

METHODS; A cross-sectional, descriptive-correlational study was conducted using data from 274 primary care patients at an FQHC. A self-administered questionnaire collected demographic, clinical, and healthcare utilization data, categorized according to the Andersen and Aday behavioral model of health service utilization. Multivariate regression analyses were performed using STATA 18 to assess associations between SDOH and healthcare utilization patterns.

RESULTS: Among the participants, 65.8% were aged 50 or older, 50.2% had an annual income of $15,000 or less, and 58.8% were unemployed. Medicare coverage was reported by 71.0% of respondents. Higher healthcare utilization was significantly associated with poverty, unemployment, and multimorbidity. Participants with Medicaid reported lower quality of life and higher social support needs compared to those with private insurance or no coverage.

CONCLUSION: SDOH play a crucial role in shaping healthcare utilization and overall well-being. Addressing economic instability, unemployment, and mental health concerns through targeted, community- based interventions may help reduce health disparities and improve health outcomes for vulnerable populations receiving care at FQHCs.

IRB Approval: This study was approved by the Research Ethics Committee of the Faculty of Medicine at the Complutense University of Madrid and conducted in accordance with internationally accepted ethical standards for human subjects' research.

UNDERSTANDING THE ASSOCIATION BETWEEN HEALTH COVERAGE AND CRANIOMAXILLOFACIAL INJURY RECOVERY AND SURVIVAL

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INTRODUCTION: Health disparities in insurance status may impact Craniomaxillofacial (CMF) trauma outcomes. This study examines the effects of insurance coverage on length of stay (LOS), survival, and surgical site infections (SSI) among CMF trauma patients in Puerto Rico.

METHODS: A retrospective analysis was conducted on 1,165 CMF trauma patients treated at the Puerto Rico Medical Center's Department of Trauma from January 2018 to October 2022. Patient demographics, trauma type, insurance coverage, and outcomes were abstracted from records. Patients were categorized by insurance status: government-only, private-only, government + private, and uninsured. Statistical analyses, including ANOVA, Chi-square tests, and t-tests, were performed to assess the relationships between insurance status and LOS, survival, operative status, and SSI.

RESULTS: Most patients (72.9%) had government insurance, and 8.5% were uninsured. Motor vehicle accidents were the leading cause of injury (49.3%). Uninsured patients had shorter LOS (mean 12.43 days) compared to those with government (20.30 days) or private insurance (16.88 days; p=0.02). Mortality rates were highest among uninsured patients (12.1%), followed by those with government + private insurance (10.0%), government-only insurance (8.8%), and private insurance (6.6%; p=0.02). While uninsured patients were less likely to undergo surgery, there were no statistically significant differences in operative rates (p=0.355) or SSI among insurance groups (p=0.847).

CONCLUSION: Government-insured patients had longer LOS but lower mortality, while uninsured patients experienced shorter stays and higher mortality, suggesting potential undertreatment. Further research surrounding the expansion of insurance coverage and follow-up care could help mitigate disparities and improve outcomes in CMF trauma.

IRB Approval: This study was approved by the Institutional Review Board of the University of Puerto Rico Medical Sciences Campus (Protocol #2303084772R001).

METHOTREXATE-INDUCED MUCOCUTANEOUS ULCERATIONS: AN EARLY CLUE TO SYSTEMIC TOXICITY

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INTRODUCTION: Methotrexate (MTX), a folate antagonist, is commonly used for autoimmune conditions like psoriasis. While MTX-induced mucocutaneous reactions are rare, they may serve as early indicators of systemic toxicity, necessitating prompt intervention to prevent serious complications. This case underscores the importance of recognizing early mucocutaneous manifestations of severe MTX toxicity.

METHODS/RESULTS: A 65-year-old male with plaque psoriasis presented with ulcerated psoriatic plaques across the chest, abdomen, and scrotum, mucosal erosions on the lips and hard palate, and development of dysphagia and dysarthria five days after initiating oral MTX. Laboratories showed elevated MTX levels, pancytopenia, and abnormal renal function. Histopathology revealed dermal perivascular lymphocytic infiltrate with eosinophils and dyskeratosis without necrosis or vasculitis. Prompt recognition led to MTX discontinuation, leucovorin rescue, hydration, and wound care. The patient's mucositis improved within one week, with complete resolution by the second week of treatment. Ulcerated lesions and friable psoriatic plaques gradually healed, leaving mild post-inflammatory hyperpigmentation. Supportive care resulted in normalization of MTX levels, white blood cell counts, and renal function, preventing further complications.

CONCLUSION: Mucocutaneous manifestations of MTX toxicity serve as critical warning signs of systemic involvement. Recognizing these dermatologic clues allows for prompt MTX discontinuation and targeted interventions, reducing the risk of life-threatening complications. Monitoring of skin lesions, blood counts, MTX levels and renal function are essential for timely identification and improved prognosis.

IRB Approval: Not applicable (retrospective case report).

TRENDS IN PRETERM LABOR AND PLACENTAL PATHOLOGY: INSIGHTS FROM A HISPANIC COMMUNITY HOSPITAL

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INTRODUCTION: As of 2022, 10% of births in the U.S. were born preterm (< 37 weeks of gestation). Of those, Hispanics represented the third highest rate (10%) of preterm births. Among mothers of Hispanic origin, Puerto Rican mothers had the highest preterm birth rate (11%) in the U.S. Our study aims to determine the preterm labor (PTL) prevalence from 2020 to 2022 in a Community Hospital based in San Juan, Puerto Rico and associated placental pathologies.

METHODS: Retrospective data was collected via EMR. A descriptive analysis was performed. SJCH IRB approval no. 020823.

RESULTS: N = 455 PTL cases, patients of all ages. PTL prevalence was 12.3%, slightly increasing from 2020 to 2022. Overall, the most common diagnoses were preterm premature rupture of membranes (PPROM) (15.6%), preeclampsia (12.10%), and previous history of PTL (9.29%). 35% of preterm births were medically indicated, primarily due to PPROM (38%) and preeclampsia (32%). Placental pathology reports were not present in about half of cases. The most prevalent placental pathologic diagnoses were reactive amnion (13.2%), acute chorioamnionitis (10.6%), and villous stromal edema (10.3%).

CONCLUSION: Our study emphasizes the need to continuously monitor preterm birth trends. Further research is needed to uncover the underlying causes of PTL and its association with placental pathology and develop targeted interventions tailored to our patient population. Such efforts may help reduce preterm birth rates in Puerto Rico and, ultimately, improve maternal and neonatal health outcomes by better understanding risk factors and preventive strategies.

EPIDEMIOLOGICAL STUDY ON THE CONSUMPTION OF MAGIC MUSHROOMS IN ADULTS OVER 21 YEARS OLD RESIDING IN PUERTO RICO

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INTRODUCTION: Psilocybin, a psychoactive compound found in fungi commonly referred to as "magic mushrooms," is consumed for both spiritual and recreational purposes. Recently, it has garnered attention for its potential psychotherapeutic effects. However, psilocybin use in Puerto Rico remains understudied. This study aims to examine patterns of use, motivations for consumption, explanatory factors, personality traits, and sex-gender differences associated with psilocybin use.

METHODS: We recruited 285 respondents through internet-based advertisements to complete an online survey, which included demographic variables, patterns of psilocybin consumption, and the Ten-Item Personality Inventory (TIPI-SPA). To address non-response and selection bias, we applied imputation and raking with trimmed weights. Logistic regression models were used to identify significant explanatory factors in both non-imputed (CC) and imputed (IR) datasets. This study was approved by the IRB.

RESULTS: The estimated prevalence of psilocybin use was 52.4% (unadjusted) and 38.6% (adjusted). Participants largely believed that magic mushrooms were non-addictive (61%) and safe (57%). Most participants reported pleasant or very pleasant experiences (88%). The mean age of first use was 24 years (SD = 6.51). Significant explanatory factors of psilocybin consumption included identifying as a man (adjusted odds ratio [aOR] = 5.78; 95% CI: 2.68-13.07), identifying as bisexual (aOR = 3.45; 95% CI: 1.25-10.07), identifying as gay (aOR = 0.15; 95% CI: 0.03-0.60), identifying as non-Christian (aOR = 3.29; 95% CI: 1.55-7.26), openness (aOR = 2.05; 95% CI: 1.47-2.94) and agreeableness (aOR = 1.62; 95% CI: 1.12-2.40).

CONCLUSION: This study provides epidemiological data on psilocybin use in Puerto Rico.

IRB Approval: 2210058187A001.

CANNABIS-RELATED EMERGENCY VISITS IN SOUTHERN PUERTO RICO (2020-2023): A RETROSPECTIVE STUDY

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INTRODUCTION: According to the Centers for Disease Control and Prevention, marijuana was the most used federally illegal drug in the U.S. in 2021. Despite its legalization in many states, including Puerto Rico, adverse effects of cannabis remain poorly understood, and its therapeutic indications are unclear. Cannabinoids, like THC, act on CB1 receptors in the brain and CB2 receptors in the body, influencing mental health and potentially increasing the risk of developing anxiety and depression. Smoking is the most common method of consumption. Both cannabis and tobacco smoking induce CYP1A2 receptors, resulting in an additive effect when smoked together. This study aimed to assess the clinical presentation and risks associated with cannabis use to educate healthcare providers.

METHODS: This study was approved by the IRB at PHSU, ensuring ethical research practices. A retrospective analysis of electronic health records from patients who underwent toxicology screening for cannabis in the Emergency Department was performed. Data was analyzed using p-values and Fisher's exact test.

RESULTS: Of 500 records analyzed, 58.9% male, 19% testing positive for cannabis. Mean age was 34 ($p<0.001$). Suicidal ideation was the most common ER presentation (36.4%), and anxiety (44.4%) and depression (63.3%) the most prevalent mental conditions. Cannabis users were 5.27 times more likely to have drug abuse-related mental conditions, double risk of cocaine use($p=0.037$), and 53.3% smoked tobacco.

CONCLUSION: These results show a strong association between cannabis, mental health disorders, and substance abuse, highlighting the need for toxicology screenings in the ED. Study limitations include incomplete substance use documentation.

IRB Approval: #2404192687.

PROXIMITY OF PUERTO RICO PUBLIC SCHOOLS TO TOXIC RELEASE FACILITIES

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INTRODUCTION: The proximity of industrial facilities to public schools raises significant concerns about environmental exposure and long-term health outcomes. Chronic exposure to toxic air pollutants, including carcinogens, has been linked to respiratory diseases and other chronic conditions. This study analyzed the spatial distribution of public schools in Puerto Rico (PR) relative to toxic release facilities to identify schools at risk and assess potential geographic differences in environmental exposure.

METHODS: Data were obtained from the PR Department of Education and the Environmental Protection Agency's Toxic Release Inventory. Geospatial analysis in R was used to create 1-mile buffers around these facilities and identify public schools within their impact zones. Proportions of affected schools were calculated by municipality. IRB approval: Not applicable.

RESULTS: Approximately 3.6% of public schools in PR are within 1 mile of a TRI facility emitting carcinogenic toxic air pollutants. A total of 9,414 students, representing 3.99% of the student population, could be exposed to these emissions. Añasco was the most affected municipality, with 83.3% of its schools potentially exposed to toxic air pollutants.

CONCLUSION: These findings highlight the urgent need for targeted environmental policies to reduce exposure in vulnerable communities. Given the well-established link between toxic air pollution and chronic diseases such as asthma and cancer, mitigating these risks is essential for chronic disease prevention and the promotion of healthy environments. This study provides critical evidence to inform public health strategies and policy interventions that address environmental factors influencing health outcomes.

LIVING NEAR ETHYLENE OXIDE EMISSIONS: CHARACTERIZATION OF VULNERABLE COMMUNITIES IN SALINAS, PUERTO RICO

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INTRODUCTION: In Puerto Rico, ethylene oxide (EtO) is mostly used as a sterilizing agent in seven industries. Sufficient evidence of carcinogenicity from human studies, including epidemiological studies and studies on the mechanisms of carcinogenesis helped the International Agency on Cancer Research to designate EtO as carcinogenic to humans (group 1). EtO has been associated with increased risk for breast cancer, leukemia, and lymphoma. The following study aimed to characterize the communities at highest risk for EtO emissions in Salinas, Puerto Rico.

METHODOLOGY: Data was obtained from the US Census Bureau, PR Department of Health, PR Central Cancer Registry, and US EPA Toxic Release Inventory. We identified communities near the facility and combine the data to describe at risk population of EtO exposure. This study was approved by UPRCCC IRB Protocol #2023-11-124.

RESULTS: Salinas is located on the southern coast of Puerto Rico, in one of the driest regions of the island. The median household income is $21,611 and 10.2% of the population live without health care coverage. The age-adjusted incidence rate (IR) of breast cancer in Salinas (46.9) which exceeds the IR of all bordering municipalities. The communities with a higher risk of EtO exposure in Salinas are: La Margarita, Residential Brisas del Mar, Villa Cofresí and Los Poleos.

CONCLUSION: This demographic research demonstrates the need for environmental epidemiology studies and participation, considering communities as active parts of the research and not as objects of study.

Published by:

PRHSJ

Puerto Rico Health Sciences Journal

for the

14th Scientific Day 2025 of the
Hispanic Alliance for Clinical and Translational Research

University of Puerto Rico Medical Sciences Campus,
San Juan, Puerto Rico