heteroresistant to fosfomycin. Of the isolates found to be susceptible by standard testing, 1(0.3%) and 9(3.6%) were heteroresistant to nitrofurantoin and trimethoprim-sulfamethoxazole by PAP, respectively. DISCUSSION/SIGNIFICANCE OF IMPACT: Despite low rates of HR to nitrofurantoin and trimethoprim-sulfamethoxazole (0.84%, 4.8%), HR to fosfomycin was more frequent (7.6%). Given that susceptibility is not generally performed for fosfomycin, this could have implications for including fosfomycin as a first-line treatment for *E. coli* UTIs.

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Assessing genetic diversity of the Pfs25 vaccine candidate: Implications for malaria transmission-blocking vaccine in Africa

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OBJECTIVES/GOALS: Transmission-blocking vaccines hold promise for malaria elimination by reducing community transmission. But a major challenge that limits the development of efficacious vaccines is the vast parasite's genetic diversity. This work aims to assess the genetic diversity of the Pfs25 vaccine candidate in complex infections across African countries. METHODS/STUDY POPULATION: We employed next-generation amplicon deep sequencing to identify nonsynonymous single nucleotide polymorphisms (SNPs) in 194 *Plasmodium falciparum* samples from four endemic African countries: Senegal, Tanzania, Ghana, and Burkina Faso. The individuals aged between 1 and 74 years, but most of them ranged from 1 to 19 years, and all presented symptomatic *P. falciparum* infection. The genome amplicon sequencing was analyzed using Geneious software and *P. falciparum* 3D7 as a reference. The SPNs were called with a minimum coverage of 500bp, and for this work, we used a very sensitive threshold of 1% variant frequency to determine the frequency of SNPs. The identified SNPs were threaded to the crystal structure of the Pfs25 protein, which allowed us to predict the impact of the novel SNP in the protein or antibody binding. RESULTS/ANTICIPATED RESULTS: We identified 26 SNPs including 24 novel variants, and assessed their population prevalence and variant frequency in complex infections. Notably, five variants were detected in multiple samples (L63V, V143I, S39G, L63P, and E59G), while the remaining 21 were rare variants found in individual samples. Analysis of country-specific prevalence showed varying proportions of mutant alleles, with Ghana exhibiting the highest prevalence (44.6%), followed by Tanzania (12%), Senegal (11.8%), and Burkina Faso (2.7%). Moreover, we categorized SNPs based on their frequency, identifying dominant variants (>25%), and rare variants (DISCUSSION/SIGNIFICANCE OF IMPACT: We identified additional SNPs in the Pfs25 gene beyond those previously reported. However, the majority of these newly discovered display low variant frequency and population prevalence. Further research exploring the functional implications of these variations will be important to elucidate their role in malaria transmission.

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Disparities in healthcare discrimination among sexual minority groups: Insights from the NIH All of Us Program

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OBJECTIVES/GOALS: Discriminatory experiences within healthcare settings significantly hinder equitable health access for sexual minority groups (SMPs) in the USA. These discriminatory experiences can manifest in various forms (e.g., refusal of care). We aimed to explore different types of discrimination encountered by SMPs in the healthcare settings. METHODS/STUDY POPULATION: This study utilized secondary data from the NIH All of Us Research Program. For this analysis, we selected cohorts self-identifying as gay (n = 9,454), bisexual (n = 15,284), lesbian (n = 5,267), and straight (n = 349,748), enabling robust comparisons across SMPs and straight individuals. We employed analysis of variance and Chi-square analyses to assess group differences in healthcare discrimination, using key indicators from the Discrimination in Medical Settings Scale. These indicators captured experiences such as being treated with less respect or courtesy and feeling ignored by healthcare providers, providing a comprehensive view of discriminatory encounters in healthcare settings for SMPs. RESULTS/ANTICIPATED RESULTS: Our analyses revealed that bisexual individuals reported the highest levels of healthcare discrimination (mean = 3.64, SD = 2.45), followed by lesbians (mean = 3.37, SD = 2.47), other SMPs (mean = 3.36, SD = 2.53), gay (mean = 2.69, SD = 2.47), and straight participants (mean = 2.60, SD = 2.42). Among the seven discrimination indicators, the most reported experience was feeling like a doctor or nurse was not listening, with 76.8% of bisexual participants, 72.3% of lesbians, 68.8% of other SMPs, and 56.9% of gay participants reporting this experience. This was followed by reports of being treated with less respect and being treated with less courtesy in healthcare settings. These findings highlight the pervasive nature of healthcare discrimination among SMPs, particularly bisexual individuals. DISCUSSION/SIGNIFICANCE OF IMPACT: SMPs experience higher levels of

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discrimination in healthcare settings compared to their straight counterparts. Our results underscore the urgent need to foster respectful, inclusive healthcare environments and ensure that healthcare providers are adequately trained to address the unique health needs and experiences of SMPs.

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Neighborhood level stressors, resilience sources, and other characteristics among sexual minority groups

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OBJECTIVES/GOALS: Sexual minority populations (SMPs), including lesbian, gay, and bisexual groups, disproportionately encounter discriminatory experiences due to bi/homonegativity and systemic inequities across various social domains. We aim to understand how the neighborhood-level stressors and resilience sources differed across specific groups in SMPs. METHODS/STUDY POPULATION: Utilizing the NIH All of Us' cloud-based platform, we selected cohorts self-identifying as gay (n = 9,454), bisexual (n = 15,284), lesbian (n = 5267), or straight (n = 349,748). We explored multiple key measures of neighborhood-level stressors (e.g., neighborhood disorder, neighborhood cohesion, and environment index) and resilience sources (e.g., neighbor cohesion, social support), and other factors (e.g., food insecurity, housing insecurity, and housing instability) by their sexual orientations using analysis of variance or Chi-square analyses. RESULTS/ANTICIPATED RESULTS: Our sample comprised 60.8% females and 37.5% males identifying as non-binary or transgender, with an average age of 55.6 years (SD = 17.1). The racial composition was 56.0% White, 19.4% Black, 18.7% Hispanic, and 5.9% others (e.g., Asian, multiracial). Compared to straight individuals, SMPs reported high neighborhood stressors (e.g., disorder, worse environment) but lower neighborhood-level resilience sources (e.g., social support, cohesion). In addition, bisexual groups reported highest prevalence of housing insecurity (6.7% vs. 2.3%), housing instability (36.0% vs. 19.6%), and food insecurity (26.57% vs. 12.21%). DISCUSSION/SIGNIFICANCE OF IMPACT: SMPs, particularly bisexual individuals, face greater neighborhood stressors and fewer resilience sources than their straight counterparts. These findings call for targeted interventions to address these disparities and promote health equity, using large-scale datasets to inform community-based solutions.

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Investigating BMI-driven variations in cancer immunotherapy treatment effect: An individual patient data meta-analysis (2013–2023)

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OBJECTIVES/GOALS: This study looks to investigate the relationship between body mass index (BMI) and the treatment effect of cancer immunotherapies. Specifically, we will assess whether there is a significant difference in survival curves associated with varying BMI levels and track trends in BMI reporting over the last decade. METHODS/STUDY POPULATION: An individual patient meta-analysis will be conducted by reanalyzing raw data of phase 3 cancer immunotherapy trials (2013–2023) accessed via the database Vivli. Prior to making a formal data request, an exploratory search will be first done through clinicaltrials.gov to assess viability. Studies that report baseline BMI and treatment efficacy will be included. BMI will be analyzed as a continuous variable, with survival curves compared across different BMI ranges using restricted mean survival time and log-rank tests. Trials will be stratified by drug class and adjusted for race, age, and gender to account for potential sources of confounding/bias. RESULTS/ANTICIPATED RESULTS: Results are currently still a work in progress as I am in the process of getting the dataset from Vivli. I anticipate that treatment effects in cancer immunotherapies will vary significantly by BMI. Furthermore, I expect to see significant disparities in survival outcomes between patients assigned to a low and high BMI category. Lastly, trends in the reporting of BMI across immunotherapy trials are expected to be inconsistent which highlights the need for more standardization in clinical trial datasets. DISCUSSION/SIGNIFICANCE OF IMPACT: This study should address critical knowledge gaps in how BMI level is associated with immunotherapy outcomes. These findings could potentially guide personalized treatment strategies and highlight the importance of standardizing the variables clinical trials chose to report.

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Prevalence of complete sample size justifications in recent publications in top clinical neurology journals

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OBJECTIVES/GOALS: This study examines prevalence of complete sample size justifications in publications in the top five clinical neurology journals. Secondary goals include comparing study designs and clinical populations to explore whether some may be more likely to include inadequate sample size considerations. METHODS/STUDY POPULATION: Recent studies (n = 125) in *Lancet Neurology*, *Alzheimer's and Dementia*, *JAMA Neurology*, *Acta Neuropathology*, and *Brain* will be evaluated. For each journal, the 25 most recent empirical articles between 2022 and 2023 will be examined for their inclusion of a justification and reproducible sample size calculation. Inclusion of components of an ideal sample size justification will be evaluated: effect size to be detected (standardized or unstandardized), alpha, power, and from where values were derived. Prevalence and completeness will be compared among study designs, clinical populations, and with regard to journal reporting requirements. RESULTS/ANTICIPATED RESULTS: At the pilot review stage, 17 of 25 included studies had any kind of sample size justification, and only 3 studies had enough information to reproduce their sample size calculations. Retrospective studies included a sample size justification more frequently (81.8% vs. 57.1%), but prospective studies had more complete sample size justifications, when present. We hypothesize that sample size calculations will be more complete in reports of clinical trials and prospective cohort studies, compared to retrospective and cross-sectional designs. Based on our previous research, we do not expect that journal reporting requirements will affect completeness of sample size justifications. DISCUSSION/SIGNIFICANCE OF IMPACT: Translational decision-making is informed in part by the robustness of current

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