access to 2.9 million medical records linked to 1.4 million persons who resided in this region at some point between 2010-2024. In this study, we used ICD-9 and ICD-10 codes to identify any patient in the REP with one or more instances of the relevant HCC codes. Charts were manually reviewed to confirm diagnosis, residency, and clinical information. All patient data were analyzed as an overall cohort and stratified by era of diagnosis or demographic characteristics. RESULTS/ANTICIPATED RESULTS: Metabolic disorders were the most prevalent HCC risk factor in this cohort, with hypertension, nonalcoholic steatohepatitis, and hyperlipidemia rates significantly increasing over the study period. Age- and sex-adjusted HCC incidence also increased over the study period from 5.39 (95% CI: 3.63, 7.98) per 100,000 person-years in 2010-2013 to 8.17 (95% CI: 6.10, 11.07) per 100,000 person-years in 2018-2021 (p=1.1844x10-4). Age, sex, and race stratification shows that this increase was driven by men, those age 65+ years, and non-Hispanic White individuals. The median survival in this cohort was 23.41 (95% CI: 19.81, 26.97) months, with surveillance status, BCLC stage at diagnosis, hypertension, and hypertriglyceridemia being associated with a significantly decreased hazard ratio of death. DISCUSSION/SIGNIFICANCE OF IMPACT: This study highlights the changing landscape of HCC etiology and increasing incidence using a population-based Midwestern cohort. Overall survival remains low, highlighting the need for more robust prevention and screening in at-risk groups.

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Associations between project attributes and research outcomes in pilot projects

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OBJECTIVES/GOALS: The Wake Forest Clinical and Translational Science Institute (WF CTSI) provides many services, but little is known about how utilization of services affects research outcomes. Our goal is to understand long-term outcomes of recurrent service use from existing resources with an eye towards creating new processes to track research outcomes. METHODS/STUDY POPULATION: The Dissemination, Implementation, and Continuous Quality Improvement team partnered with the Biostatistics, Epidemiology, and Research Design (BERD) program for this project. Initially, we aimed to track abstract and paper publications, and grant submissions (unfunded and funded) for all service requests coming through the BERD from 2017-2024. This was quickly deemed infeasible using prior CTSI data collection processes; however, detailed follow-up data did exist on funded CTSI pilots in the same time window. Consequently, we aimed to test associations between project attributes provided on the service request form and downstream research outcomes, including peer-reviewed publications and grant funding. We used chi-squared tests in the Python package "tableone" to test these associations. RESULTS/ANTICIPATED RESULTS: Our sample only included WF CTSI pilot-funded projects; though, unexpectedly we found information on pilot projects funded by different sources including center/institutional pilots, federal funding, foundation grants, and internal/departmental funding. We found it most effective to link service requests with IRB numbers, because different principle investigators can submit requests on behalf of the same project. N=206 total projects were included in the analysis. Regarding peer-reviewed publications, associations were found with type of service, principal investigator rank, and IRB approval status. Regarding grant funding, associations were found with service type, principal investigator career stage, and previous principal investigator grant funding. DISCUSSION/SIGNIFICANCE OF IMPACT: As part of a large academic learning health system, the WF CTSI provides support to various investigators and tracking long-term research outcomes is a priority. This investigation identified important predictors of successful publications and grants in pilot projects, though it also identified gaps in processes to track research outcomes.

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GoFiguR: A web-based app for creating and modifying figures

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OBJECTIVES/GOALS: The goal was to create and deploy an intuitive, easy-to-use tool that clinical investigators can use to make or modify high-quality figures for publication. METHODS/STUDY POPULATION: We developed GoFiguR, an interactive application built with RShiny, to help researchers and analysts visualize their data with ease. Users upload data files, choose a plot type (histogram, scatterplot, boxplot, bar plot, or Kaplan-Meier curve), and then specify variables, labels, and font sizes to generate the figure. Alternatively, users can upload a ggplot2 object to modify labels, font sizes, or plot themes in an existing figure. All figures can be exported either as ggplot2 object for additional modification or as one of multiple file formats with user-defined dimensions and resolution. GoFiguR is hosted on a secure, university-maintained website with access limited to university personnel. Instructional step-by-step handouts were developed to assist investigators in the use of the app. RESULTS/ANTICIPATED RESULTS: We plan to integrate GoFiguR into the biostatistics consultative services offered by our Clinical and Translational Science Program. In practice, we anticipate several use cases: investigators and analysts can use GoFiguR to generate mock figures during project planning, analysts can create visualizations following data analysis, and investigators can apply final edits to figures prior to dissemination. Through this

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collaborative process, investigators are expected to gain a deeper understanding of appropriate figure types for various data visualizations. DISCUSSION/SIGNIFICANCE OF IMPACT: Creating publication-quality figures is often a time-intensive process requiring multiple iterations, between the investigator and analyst. GoFiguR enables more efficient development of figures as investigators can directly modify figures to their specification.

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From plate to pillow: The effects of ultra-processed foods (UPFs) on sleep duration and memory in adults over 60 years of age

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OBJECTIVES/GOALS: The objective of my study is to examine the relationship between ultra-processed foods, sleep duration, and memory in adults aged 60 years and older. Diet and sleep are often studied independently as modifiable risk factors for cognitive decline; a growing body of evidence suggests a unique nexus between the two with regard to cognitive outcomes. METHODS/STUDY POPULATION: A cross-sectional analysis will be conducted using data from the National Health and Nutrition Examination Survey (NHANES) among participants aged 60 years and older from 2011 to 2014. The NOVA system, which classifies food according to the extent of processing, ranging from whole foods to ultra-processed foods, will be used to calculate dietary intake from two 24-hour recalls. Sleep duration will be analyzed using self-reported average hours of sleep per night, and cognitive performance will be evaluated using word recall and verbal fluency tests. Food insecurity, socioeconomic status, education, and race/ethnicity will be analyzed as covariates. Descriptive and multivariable regression analysis will be used to assess statistical associations. RESULTS/ANTICIPATED RESULTS: As ultra-processed foods cause oxidative stress and neuroinflammation, higher consumption of these foods, which are high in fat, sodium, and sugar, is anticipated to be associated with shorter sleep duration and poor memory performance. A dose-response relationship is predicted. These associations are expected to be exacerbated in food-insecure environments, where ultra-processed foods are readily accessible, particularly among individuals with lower socioeconomic status. Data may also reveal differences based on race/ethnicity or educational attainment, highlighting important disparities in the social determinants of health. The study is expected to reveal trends in sleep inequity, where economic disadvantages and food insecurity contribute to shorter sleep durations. DISCUSSION/SIGNIFICANCE OF IMPACT: This study seeks to identify modifiable behavioral risk factors for cognitive decline, particularly for older adults. By uncovering how diet and sleep interact to influence brain health, this study can guide practical interventions, such as nutrition and sleep education, to slow cognitive decline and improve quality of life for aging adults.

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Characterizing ocular adverse events in clinical trials of GLP-1 drugs using weighted and unweighted participant counts results reported on ClinicalTrials.gov

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OBJECTIVES/GOALS: Ocular adverse events (OAEs) have been associated with GLP-1 use in clinical studies. This study aims to describe the proportion and distribution of ocular adverse events by treatment arm, including serious and non-serious events, in phase 2-4 clinical trials of GLP-1 drugs using publicly available ClincialTrials.gov data. METHODS/STUDY POPULATION: The ClinicalTrials.gov database was searched on 9/11/25 for interventional studies with GLP-1 as treatment (n= 1545). The search was filtered to terminated and completed studies with results (n= 349). Adverse event reports from Clinical Trials Transformation Initiative (CTTI) Aggregate Analysis of ClinicalTrials.gov (AACT) database were restricted to phase 2-4 drug studies (n= 240), of which 167 involved a GLP1-1 drug with 64 studies reporting ocular adverse events. Ocular adverse events were summarized as weighted and unweighted mean proportions by arm and seriousness, with chi-square, Fisher's exact, and Wilcoxon tests assessing significance. Study characteristics were included in statistical models to further assess differences in ocular adverse event proportions. RESULTS/ANTICIPATED RESULTS: Ocular adverse events ranked 10 among top organ systems affected in GLP-1 drug trials. Among 64 studies reporting ocular adverse events, serious ocular event proportions were higher in GLP-1 arms compared to placebo (weighted: $p < 0.01$; unweighted: $p = 0.02$). Most studies (n = 51) systemically assessed ocular events; 10 were non-systematic, and 3 did not classify reporting. The top 10 ocular events highlighted retinal detachment at significantly higher proportions in drug arms than placebo arms (weighted: 0.11% vs. 0.02%, $p = 0.04$). Cataract and diabetic retinopathy events were observed less frequently in drug arm than placebo arm (weighted: $p = 0.02$; $p = 0.03$). DISCUSSION/SIGNIFICANCE OF IMPACT: Serious and non-serious ocular adverse events occurred more often in GLP-1 drug arms, driven by specific conditions such as retinal detachment. Using the AACT database enables large-scale evaluation of adverse event patterns, providing broader context than single-study analyses.

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Using clinical trials transformation initiative AACT database to assess adverse events in clinical trials of GLP-1 drugs

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OBJECTIVES/GOALS: The study aims to systematically characterize the frequency and distribution of serious and non-serious

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