SSS Update is a periodic look at selected SSS staff research activities, new awards, and upcoming conference presentations. For additional information about SSS, visit our website.

## Research Activities

Unless another funding source is named, the research activities described below were funded wholly or in part by the federal government.

## Recent Publications

### Improving Hurricane Harvey Disaster Research Response through Academic-Practice Partnerships
SSS’ Disaster Research Response project leader Steve Ramsey is among the authors of an article in the *American Journal of Public Health* that described how, after Hurricane Harvey, researchers, media, and public health agencies collected data in Houston to assess health effects and inform the public. To limit redundancy and ensure sampling coverage of impacted areas, research and practice partners used disaster research response (DR2) resources and relied on partnerships formed during a 2015 DR2 workshop in Houston. Other authors include researchers from the University of Delaware, University of Texas Health Science Center at Houston, University of Texas Health San Antonio, Houston Health Department, and the National Institute of Environmental Health Sciences.

### Blood BTEX Levels and Neurologic Symptoms in Gulf State Residents
SSS health researcher John McGrath is among the authors of an article in *Environmental Research* that examined neurologic effects of environmental exposure to BTEX (benzene, toluene, ethylbenzene, and xylenes) among 690 Gulf state residents. Half of the participants reported at least one neurologic symptom—likely driven by exposure to benzene or toluene. The other authors of the article are researchers from the National Institute of Environmental Health Sciences, University of North Carolina, and National Cancer Institute.

### Fertility-related Experiences after Breast Cancer Diagnosis: Findings from the Sister and Two Sister Studies
SSS health researcher M. Elizabeth Hodgson is among the authors of an article in *Cancer* that assessed the prevalence of fertility counseling provided to 432 women diagnosed with breast cancer before the age of 45 and determined that 67 percent had not discussed the effects of treatment on fertility with a health care provider before or during treatment. At diagnosis, approximately 20 percent were interested in future fertility; however, only eight women reported using fertility preservation strategies. Other authors of the article include researchers from the University of North Carolina at Chapel Hill, Centers for Disease Control and Prevention, and the National Institute of Environmental Health Sciences.

### Chronic Antibiotic Use in Adulthood and Weight Change: Findings from the Sister Study
SSS health researcher Sandra Deming-Halverson is among the authors of an article in PLOS ONE that examined associations between chronic antibiotic use and weight among adults in the general population. The researchers concluded that chronic use may have long-lasting impacts on BMI. Other authors include researchers from the University of North Carolina at Chapel Hill, University of Arizona, and the National Institute of Environmental Health Sciences.
More Acidic Diet Associated with Risk of Breast Cancer: Findings from the Sister Study

SSS health researcher M. Elizabeth Hodgson is among the authors of an article in the *International Journal of Cancer* that used data from 43,000 Sister Study participants to estimate diet-dependent acid load. Results suggest that diets high in fruits and vegetables and low in meat may be protective against hormone receptor negative breast cancer. Other authors include researchers from the National Institute of Environmental Health Sciences, University of South Carolina, Simmons College, Harvard T.H. Chan School of Public Health, and Westat.

Pediatric Urinary Stone Disease: The Urologic Diseases in America Project

SSS researchers Julia Ward, Lydia Feinstein, Casey Pierce, and John Lim are among the authors of an article in *Urology* that examined the rates and treatment patterns of pediatric stone disease based on administrative health claims for individuals covered by commercial insurance. The analysis demonstrated differences by age, gender, race/ethnicity, and geographic region. Other authors are researchers from the National Institute of Diabetes and Digestive and Kidney Diseases and Johns Hopkins University.

Opioid Use among Adults Treated for Conditions Associated with Chronic Pain

SSS senior data scientist Zhengyi Fang is among the authors of an Agency for Healthcare Research and Quality (AHRQ) Research Findings report on opioid use. In 2016, the Centers for Disease Control and Prevention (CDC) released new prescribing guidelines intended to address the concern that high dosages and longterm use of opioids can lead to opioid use disorder and its adverse health outcomes. Recently, the authors of the CDC guidelines acknowledged that doctors and others in the health care system have often wrongly implemented the recommendations. The AHRQ Research Findings report examines variation in opioid use among individuals treated for conditions associated with chronic pain during the 3-year period prior to release of the guidelines versus those not treated for those conditions but having some medical care for other chronic or non-chronic conditions during the same period. The results provide baseline data that can help inform patients, providers, and policymakers as they continue to monitor the effects of the opioid crisis and the impacts of efforts to address it. Other authors of the report are researchers from AHRQ.

The Relationship between Progesterone and Sleep in Young Women

SSS health researcher John McGrath is among the authors of an article in the *Journal of Clinical Endocrinology and Metabolism* that describes a study of progesterone exposure and sleep-related changes during the menstrual cycle of early postmenarchal girls. Other authors of the article are researchers from the National Institute of Environmental Health Sciences, Case Western Reserve University, Massachusetts General Hospital, Laboratory Corp, and ZRT Laboratory.

Epilepsy, Antiseizure Medications, and All-cause Mortality in Dialysis Patients

SSS epidemiologists Julia Ward, Adan Becerra, Timothy Powers, and Chyng-wen Fwu are among the authors of an article in *Kidney International* that describes a retrospective cohort study using the United States Renal Data System to assess mortality and antiseizure medication prescriptions among patients with end stage renal disease (ESRD) with and without a diagnosis of epilepsy. Findings showed that patients with ESRD treated with dialysis have a high prevalence of epilepsy, which was associated with increased mortality risk compared to those without epilepsy. Other authors of the article are researchers from the Atlanta Veterans Affairs Medical Center, Phoenix Children’s Hospital, and the National Institute of Diabetes and Digestive and Kidney Diseases.

Framework for Identifying Placenta-related Research for Curated Research Dataset Using Natural Language Processing Techniques

SSS researcher Lydia Rogers is among the authors of an article in the *Journal of Biomedical Informatics* that describes the development of a multi-layer framework to systematically identify publications from PubMed relevant to the Placental Atlas Tool project. This framework employs multiple well-known Natural Language Processing components including Medical Subject Headings (MeSH) based Naïve Bayes classifier, abstract based text similarity comparison, and MeSH based
article prioritization. In addition, the SSS team developed a user-friendly web application to incorporate human judgement at the final stage of publication identification. The approach can be easily extended to support research in other scientific fields. The coauthors of the publication are former SSS researchers.

**Quality Control of Quantitative High-throughput Screening Data**
SSS senior analyst Shawn Harris is among the authors of an article in *Frontiers in Genetics* that describes an automated quality control procedure for quantitative high-throughput screening experiments that generate concentration-response profiles to screen compounds for potentially adverse effects. The automated QC procedure sorts out compounds with inconsistent response patterns and produces trustworthy parameter estimates. Other authors include researchers from the National Institute of Environmental Health Sciences, University of Pennsylvania, North Carolina State University, and University of Pittsburgh.

**Synergistic Association of House Endotoxins and Air Pollution with Emergency Visits for Asthma**
SSS research data analysts Jesse Wilkerson and health researcher Lydia Feinstein are among the authors of an article in *The American Journal of Respiratory and Critical Care* that examined the effects on asthma of co-exposure to house endotoxin and ambient air pollution. Based on data from participants in the National Health and Nutrition Examination Survey, the researchers concluded that decreasing exposure to both stressors may help reduce visits to the emergency room and asthma morbidity. Other authors include researchers from the University of Iowa, the National Institute of Environmental Health Sciences, and HHS Office of Emergency Management.

**Phantom Odor Perception and Vascular Conditions among Adults**
SSS health data analyst and senior project manager Danita Byrd-Clark is the coauthor of an article in *Laryngoscope* that describes an exploration of associations between vascular conditions and phantom odor perception (i.e., reporting an unpleasant or burning odor when nothing is there). Data from the National Health and Nutrition Examination Survey show that vascular conditions including stroke, angina, congestive heart failure, and well-managed high blood pressure and high cholesterol are associated with phantom odor perception. Vascular or metabolic conditions or their treatments may contribute to reporting of phantom odor perception. The article is coauthored with a researcher from the National Institute on Deafness and Other Communication Disorders.

**Conference Presentations**

**Diet Quality and Risk of Breast Cancer: Findings from the Sister Study**
SSS health researcher M. Elizabeth Hodgson was among the authors of a poster presented at the 2019 American Society of Preventive Oncology Meeting. The poster described a study of diet, inflammation, and oxidative stress and presented evidence on the association between pro-inflammatory/pro-oxidative diet and breast cancer risk, particularly triple negative breast cancer. Other authors included researchers from the National Institute of Environmental Health Sciences, University of South Carolina, and Harvard T.H. Chan School of Public Health.

**Mortality among Oil Spill Response and Cleanup Workers Following Deepwater Horizon Disaster**
SSS epidemiologist Lydia Feinstein presented a talk at the 2019 Society for Epidemiologic Research Annual Meeting. Other SSS authors included Nathaniel MacNell, Matthew Curry, and John Lim. The presentation examined mortality among oil spill response and cleanup workers 1–6 years following the Deepwater Horizon disaster based on data from 32,360 participants in the Gulf Long-Term Follow-up study, a prospective study of oil spill response and cleanup workers and non-workers. Other authors
included researchers from the University of North Carolina at Chapel Hill and the National Institute of Environmental Health Sciences.

**Lung Function in Oil Spill Responders 4–6 Years after the Deepwater Horizon Disaster**

SSS researchers John McGrath, W. Braxton Jackson II, and Matthew Curry were among the authors of an oral presentation at the 2019 Society for Epidemiologic Research Annual Meeting. While individuals who participated in the oil spill response and cleanup efforts following the Deepwater Horizon disaster had reduced lung function 1–3 years later, this study looked at whether reduced lung function has persisted, using data from the Gulf Long-Term Follow-up Study to examine lung function 4–6 years later. Other authors of the presentation included researcher from the National Institute of Environmental Health Sciences, Tulane University School of Public Health and Tropical Medicine, University of North Carolina School of Public Health, Stewart Exposure Assessments, and Exposure Assessment Applications.

**Insights on Practice Patterns: The Urologic Diseases in America Project**

SSS researchers Lydia Feinstein, Julia Ward, Casey Pierce, and John Lim were among the authors of an oral presentation at the 2019 American Urological Association Annual Meeting. The presentation described findings from the Urological Diseases in America project, including trends in the clinical management of benign prostatic hyperplasia, urinary incontinence, urinary stone disease, hypospadias, and urinary tract infections. Other authors included researchers from Johns Hopkins University and the National Institute of Diabetes and Digestive and Kidney Diseases.

**Persistent Disparities in Urinary Tract Infections by Gender, Race/Ethnicity, and Socioeconomic Status: The Urologic Diseases in America Project**

SSS research scientists Julia Ward, Casey Pierce, John Lim, and Lydia Feinstein are among the authors of a poster at the 2019 Society for Epidemiologic Research Annual Meeting. The poster described 10-year trends in prevalence of urinary tract infections and persistent disparities by age, gender, race/ethnicity, and socioeconomic status. Other authors included researchers from Johns Hopkins Brady Urological Institute and the National Institute of Diabetes and Digestive and Kidney Diseases.

**Trends in Urinary Tract Infection Prevalence and Pharmacotherapy: The Urologic Diseases in America Project**

SSS researchers Julia Ward, Lydia Feinstein, Casey Pierce, and John Lim were among the authors of a poster at the 2019 International Conference on Pharmacoepidemiology & Therapeutic Risk Management. The poster described the 10-year trends in prevalence of urinary tract infections (UTI), sociodemographic characteristics associated with UTI, and UTI-related medication prescription practices among U.S. adults. Other authors included researchers from the Johns Hopkins University School of Medicine and the National Institute of Diabetes and Digestive and Kidney Diseases.

**The Association between Heart Rate, Glycemia, and A1c Levels**

SSS epidemiologist Sarah Casagrande was among the authors of a poster presented at the 2019 American Diabetes Association Scientific Sessions. Evidence suggests that heart rate is a prognostic factor for cardiovascular disease, for which persons with diabetes are at increased risk. The researchers examined the association between heart rate and levels of glycemia and found that mean heart rate was higher among persons with diabetes compared to those without diabetes. In addition, among those with diabetes, mean heart rate increased with increasing A1c, a measure of average blood glucose. Other authors included researchers from the National Institute of Diabetes and Digestive and Kidney Diseases, University of Miami, University of Manchester, and University of Michigan.
**The Burden of Diabetes in the United States**  
SSS epidemiologist Sarah Casagrande spoke at a policy summit sponsored by the Partnership to Advance Cardiovascular Health and the Institute for Patient Access in Washington, DC. She discussed the prevalence and incidence of diabetes in the United States, trends in demographics and health insurance coverage for those with diabetes, and the prevalence of those with diabetes meeting their A1c, blood pressure, and cholesterol goals.

**Racial/Ethnic Disparities in Sleep Disturbances among Pregnant and Non-Pregnant Women**  
SSS epidemiologist Lydia Feinstein was among the authors of an oral and poster presentation at SLEEP 2019 that investigated associations between pregnancy, sleep, and race/ethnicity among a nationally representative sample of women of reproductive age. Other authors of the presentation included researchers from the National Institute of Environmental Health Sciences, RAND Corporation, Brown University, and the National Institute on Minority Health and Health Disparities.

**The Effects of the Menstrual Cycle and Caloric Restriction on Sleep in Young Women**  
SSS health researcher John McGrath was among the authors of a poster presented at the 2019 Endocrine Society Annual Meeting and at the Association of American Physicians/American Society for Clinical Investigation/American Physician-Scientists Association Joint Meeting. The poster described a study to evaluate the effects of hormonal changes across the menstrual cycle on objective sleep measures in young women. Other authors included researchers from Case Western Reserve University, the National Institute of Environmental Health Sciences, and University of North Carolina at Chapel Hill.

**Validation of Questionnaire-based Definitions for Chronic Obstructive Pulmonary Disease**  
SSS researchers Lydia Feinstein, Jesse Wilkerson, Matthew Bridge, and Matthew Curry were lead authors of a poster at the 2019 Society for Epidemiologic Research Annual Meeting. The presentations described a study that validated questionnaire-based definitions of chronic obstructive pulmonary disease (COPD) against objective lung-function data. The researchers examined three COPD definitions from the literature and a new definition they developed empirically using machine learning. Other authors of the presentations were former SSS staff and researchers from the National Institute of Environmental Health Sciences and University of Iowa.

**Measurement Error Correction of Self-reported Smoking using Ensemble Machine Learning**  
SSS researchers Nathaniel MacNell and Matthew Curry were among the authors of a poster at the 2019 Society for Epidemiologic Research Annual Meeting. The poster described an assessment of a novel application of machine learning to correct for measurement error in self-reported smoking. Questionnaire data on the prevalence of smoking were compared to serum cotinine measurements consistent with current smoking. Other authors included researchers from the National Institute of Environmental Health Sciences and University of North Carolina at Chapel Hill.

**Data Confounding Due to Litter Effects across Multiple Toxicity Studies in Rats**  
SSS research scientists Jeffrey Krause, J. Sandra McBride, and Marjo Smith were among the authors of a poster at the 2019 Society of Toxicology Annual Meeting. The poster described an analysis of National Toxicology Program data of rodent fetal and pup body weights and their relation to litter size. Responses to tested compounds may cluster by litter due to shared genetics and/or lactation environments potentially affecting analysis methods. Other authors of the poster include researchers from the National Institute of Environmental Health Sciences.

**Interferon-regulated Genes in Juvenile Dermatomyositis**  
SSS health researcher John McGrath was among the authors of a poster at the 2019 Global Conference on Myositis. The poster described a study to characterize peripheral blood interferon-regulated gene expression in juvenile dermatomyositis—an autoimmune disease in children that causes skin rash and muscle weakness. Other authors included researchers from the National...
Institute of Arthritis and Musculoskeletal and Skin Diseases, the National Institute of Environmental Health Sciences, the National Institute of Allergy and Infectious Diseases, and University of Oklahoma Health Sciences Center and Oklahoma Medical Research Foundation.

**Early Screen Time and Autism Symptoms: Data from The National Children’s Study**
SSS health researcher Kathleen McCann was among the authors of a poster at the 2019 Society for Research in Child Development Biennial Meeting. The poster described a study that used data from The National Children’s Study Archive to examine how screen time, caregiver reading time, and caregiver playing time influence the development of autism symptoms in the first 2 years of life. Other authors of the poster included researchers from Drexel University.

**Environmental Management of Asthma in Clinical Practice**
SSS researchers Jesse Wilkerson and Lydia Feinstein were among the authors of an oral presentation at the 2019 American Academy of Allergy, Asthma & Immunology Annual Meeting. The poster described an examination of clinicians’ environmental control practices in managing their patients’ asthma. Recommendations to avoid dust mites, mold, pests, and air pollution varied, but almost all clinicians recommended avoidance of second-hand tobacco smoke. Other authors of the presentation included researchers from the National Institute of Environmental Health Sciences, Centers for Disease Control and Prevention, University of Connecticut Health Farmington, Connecticut Children’s Medical Center, Virginia Commonwealth University, Johns Hopkins University, and the Environmental Protection Agency.

**New Awards**

**Urologic Diseases in America Project for the National Institute of Diabetes and Digestive and Kidney Diseases**
SSS has been awarded a contract to continue to provide scientific and technical services for the Urologic Diseases in America research compendium, a project sponsored by the National Institute of Diabetes and Digestive and Kidney Diseases. The SSS team will conduct analyses of multiple large data sources to quantify the burden of non-malignant urological diseases on the American public and examine trends in clinical practice patterns, treatment outcomes, and expenditures. Tasks include leading the production of annual research compendiums and dissemination of data via scientific publications, presentations, and other platforms.

**Technical Assistance for the Development of Common Formats and Quality and Safety Review System for AHRQ**
SSS has been awarded a GSA contract with the Agency for Healthcare Research and Quality to provide technical and clinical expertise related to the enhancement and development of common formats and the development of the Quality and Safety Review System—an improved patient safety surveillance system that generates adverse events from post-discharge chart abstraction—soon to replace CMS’s existing Medicare Patient Safety Monitoring System.

**Support for the Clinical Trials Center at Walter Reed Army Institute of Research**
WRAIR is the largest and most diverse biomedical research laboratory in the DoD. Under this contract, SSS is providing subject recruitment and advertising services in support of WRAIR clinical trials. The work is being conducted under subcontract to the nonprofit Alaka ‘ina Foundation.
## Upcoming Conferences

Attend a presentation by SSS staff at these upcoming conferences.

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<tr>
<th>Conference</th>
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<tr>
<td>National Association of Health Data Organizations (NAHDO) 2019 Health Care Data Summit</td>
<td>November 6–8</td>
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<tr>
<td>• Plenary Session Workshop: Value Based Purchasing (Quality and Cost)</td>
<td>Little Rock, AK</td>
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<td>Friday, November 8, 10:30 a.m.–noon</td>
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