

II. Summary

The Survey of the Health of Wisconsin (SHOW) is a unique, state-of-the-art population health research infrastructure, having completed data collection from a representative sample of over 5,000 Wisconsin residents, across 62 counties since 2008. In the 2016 sample, SHOW added 713 adults and 220 children to the survey. SHOW is widely used as a tool for monitoring the health of communities and for both academic and community-driven population research. In the last year, SHOW data contributed to: more than 10 new peer-reviewed publications; more than 20 dissemination and scientific presentations; and more than a 20 grant applications by Wisconsin investigators. The SHOW infrastructure, including its biorepository, is an unparalleled resource for supporting interdisciplinary and transdisciplinary research. The infrastructure is currently poised to support new initiatives across the SMPH including support of novel microbiome and genetics research. It continues to serve as a unique resource available to students as well as a variety of public health practitioners and health providers for generating data and evidence to drive health planning, prioritization and improvement.

III. Detail

1. Goals and Objectives

Below, we outline our progress in the past year (03/1/2016-2/29/2017) by aim, describing how SHOW has continued to meet its specific aims during the current award cycle.

Aim 1: Maintain a novel population health research infrastructure for tracking trends in priority health indicators and allowing transdisciplinary research examining the multiple determinants of health and health disparities in Wisconsin by:

1.1 Continuously gathering robust measures of a broad range of health determinants including: biologic, sociodemographic, behavioral, attitudinal, environmental, psychosocial, and health care factors in a representative statewide sample and subsamples in selected counties.

- **SHOW's 2016 data collection cycle is nearly complete; 933 individuals (713 adults and 220 children) have participated** from Brown, Eau Claire, Milwaukee and Waushara counties. 2016 is the final year of the combined 2014-2016 three-year sample. 2016 posted the highest recruitment numbers of the three years included in the sample and builds upon the 1665 participants (1240 adults and 425 children) enrolled in 2014 and 2015, for **2598 total participants in our three-year sample.**
- **SHOW's recruitment total as of March 2017 is 5,982 individuals**, recruited across 62 counties in Wisconsin from 2008 through 2016.
- **Longitudinal follow-up** of SHOW 2008-2013 participants began in February 2017 and is scheduled to be completed by fall 2017. Our goal is to complete follow-up studies on 700-900 past SHOW participants and enroll 200 of their children.
- The content of the survey continues to address a **broad spectrum of health determinants**, including biologic, sociodemographic, behavioral, attitudinal, environmental (both built and physical), psychosocial, and health care factors, in a **representative statewide sample.**
- SHOW has maintained and continues to support a **rigorous infrastructure for household-based examination survey research.** Our administrative leadership, field team management and scientific staff have expertise in at-the-door recruitment, physical measurements, data collection, sample storage, and data processing. **Planning for the 2018-2020 sample is underway**, with data collection proposed to begin in Spring 2018.

1.2 Maintaining a biorepository to support University-wide collaborations for mechanistic, gene-environment and epigenetic or other "omics" research on a broad range of outcomes.

- SHOW continues to maintain an extensive biorepository of serum, plasma, urine, DNA and, since 2014, whole blood intended for RNA extraction, to support many investigations on diverse research topics (**Appendix A**).
- As previously noted, Dr. Maria Nikodemova was hired to support SHOW in a 50% position to support outreach across the UW Campus to increase awareness regarding SHOW resources and availability of biosamples for inter-disciplinary and translational research. Over a dozen (n=18) presentations were made to various SMPH departments and other schools in the last year, some of which were made at the request of attendees to a prior presentation. For example, members of the UW Carbone Cancer Center requested additional meetings as well as data summaries for the center's May 2017 grant application following a presentation to the leadership team last fall.

- Over 4,400 participants (adults) provided biospecimens to the biorepository to-date, including 83% of adults seen in 2016, increased from our average of 79% in 2014 and 2015. Of note, 564 (13%) of these individuals are minority. Table 1 summarizes biosamples collected through the 2016 data collection cycle, including stool and saliva specimens collected and stored with the ancillary WARRIOR project.

Table 1. SHOW biosamples (N) by year

	2008	2009	2010	2011	2012	2013	2014	2015	2016	TOTAL
Participating Subjects	198	296	853	802	389	379	411	559	592	4,479
Serum aliquots	1,884	2,743	8,643	8,698	4,659	4,698	3,970	5,982	5,884	47,161
Plasma aliquots	2,853	3,720	10,728	11,132	5,888	6,025	4,997	7,002	7,184	59,529
Urine aliquots	2,515	4,017	12,442	12,686	5,534	5,474	5,265	7,108	8,275	63,316
Whole blood (PaxGene)							354	504	524	1,382
DNA (blood or saliva)	103	272	819	781	377	378	388	532	568	4,218
WARRIOR - stool									508	508
WARRIOR - saliva									552	552

- **Facilitating the use of our biorepository** is a high-priority for SHOW and these activities have grown in the past year. Several grants proposing to utilize the biorepository have been submitted or resubmitted in our current award cycle or are under development. Currently funded projects utilizing the biorepository and/or SHOW's sample collection and handling expertise are also described below. Of these, 11 were submitted to NIH or other federal funding sources outside the UW.
 - Dr. Robert Lipinski in Veterinary Medicine resubmitted his R01 application to NIH/NIEHS to examine the developmental toxicity of, and to determine population-based estimates of exposure to, a pesticide synergist and Hedgehog pathway inhibitor, piperonyl butoxide using the SHOW biorepository to estimate exposures and pesticide use in select women of reproduction age.
 - The WPP funded 'Winning the War on Antibiotic Resistance in Wisconsin' (WARRIOR, Co-PI's Dr. Nasia Safdar and Dr. Ajay Sethi) ancillary study has successfully piloted adding stool, saliva and skin, oral and nasal swabs, to examine presence of Multi-drug resistant organisms, microbiota diversity and added extensive diet capture and risk factor data into the SHOW core in 2016; data collection remains on-going in 2017 with an estimated number of participants over 600.
 - Building on the WARRIOR success, longitudinal follow-up of the WARRIOR-SHOW cohort over the years 2018-2020 was also proposed in a February 2017 NIH R01 submission lead by Drs. Safdar and Sethi.
 - Other projects building on the WARRIOR specimens and testing as well as SHOW core specimens and data have also been recently proposed.

- Dr. Safdar with Dr. Malecki submitted projects proposing to evaluate relationships between environmental exposures measured in SHOW urine samples and multi-drug resistant organism colonization in a recent funded Department of Medicine pilot and in an ICTR pilot submitted this month.
 - Dr. Safdar also submitted a research application to the Office of the Vice Chancellor for Research and Graduate Education's (VCRGE) Microbiome Initiative in partnership with SHOW.
 - Dr. Laura Knoll (Microbiology) submitted a Microbiome Initiative application that builds on microbiome diversity testing planned for WARRIOR samples as well as on SHOW core serum samples.
 - Dr. Ajay Sethi proposed a new Population-based Microbiome Research Core (PMRC) in response to the VCRGE Microbiome Initiative, to build on the WARRIOR cohort within SHOW and leverage support from the SHOW biorepository infrastructure to expand microbiome research investigations across the UW campus.
 - Dr. Malecki with Dr. Safdar also applied for Institute for Clinical and Translational Research (ICTR) pilot award funds to explore triclosan, an emerging contaminant in both medical settings and drinking water to examine impact on gut microbiome and MDROs.
- v. SHOW has had several ancillary studies with the Wisconsin Department of Health Services (DHS) that use SHOW's expertise and training in household-based biosample collection. In 2016, SHOW worked with DHS to apply for funds through the Agency for Toxic Substance and Disease Registry (ATSDR) with the CDC to collect biospecimens among high-risk anglers in the Milwaukee Area of Concern. The ATSDR grant was funded and project planning is underway; data collection is slated to take place in summer 2017 through summer 2018.
- vi. Dr. Mari Palta's proposal (Population Health Sciences) to NIH/NIDDK in 2016 is under revision for resubmission as an R01 application. This project will use SHOW's infrastructure to provide data collection for the longitudinally followed Wisconsin Diabetes Registry Study cohort at 25-30 years diabetes duration as well as data and biospecimens among non-diabetic persons with and without kidney disease in the SHOW biorepository/dataset to serve as comparison in evaluating novel kidney disease biomarkers.
- vii. Dr. Corinne Engelman's NIH/NIDDK funded R56 project is on-going; 400 plasma and 400 serum samples were pulled from the biorepository for analysis and linked to existing SHOW core data in the past year. In 2016, the SHOW core survey was also expanded in order to capture vitamin D intake as well as sun exposure data. Serum, plasma and DNA for N=55 African American individuals completing IHQs in 2016-2017 will also be pulled from the biorepository in the coming weeks.
- viii. Other partnerships proposing to use SHOW's specimen collection and handling expertise include Dr. Elizabeth Cox's DP3 application to NIH/NIDDK in 2016
- ix. Dr. Martin Shafer's recent application to the EPA proposed for the first time to use the SHOW infrastructure as a foundation to support a targeted intervention study aimed at evaluating the effectiveness of indoor air filters in reducing asthma triggers and providing education among asthmatics identified through SHOW.

- x. Dr. Christopher Bradfield of the Molecular and Environmental Toxicology Center for evaluating susceptibility and response to environmental pollutant exposure using samples from the SHOW biorepository as well as SHOW core data. A P30 center grant was also submitted (April 2016) to NIH/NIEHS proposing the use of SHOW's infrastructure and biorepository to expand environmental health investigations on campus. He also submitted an R35 to use SHOW data in Fall 2016 that was resubmitted in March 2017.
- xi. Dr. Malecki submitted an R01 in February 2017 to examine The Role of the Aryl-Hydrocarbon Receptor Response Genes in Determining Human Sensitivity to environmental toxicants. A transdisciplinary approach was proposed to examine dosimetry, temporality and cellularity among mouse models in Dr. Bradfield's laboratory and parallel human studies using SHOW data. Analyses of SHOW RNA samples by Dr. Malecki and SHOW Scientist, Dr. Maria Nikodemova have made preliminary investigations possible for these submissions.
- xii. Dr. Malecki also submitted an R21 application to NIH in November 2016 with colleagues from the Center for Demography and Ecology (CDE) proposing to use DNA methylation as an epigenetic marker of biological aging to determine associations with individual and neighborhood level stressors in order to examine mechanisms behind social disadvantage, that is, to determine 'epigenetic signatures of stress'. This application and related on-going activities above represent the ideal, combined use of both the SHOW biorepository and SHOW core data.
- xiii. Co-Director Dr. Paul Peppard in February 2017 submitted an R01 application to examine longitudinal associations between sleep and metabolic health in children using the SHOW infrastructure. Dried blood spots were piloted among children and preliminary testing of dried blood spots for metabolic parameters was performed by Dr. Maria Nikodemova in collaboration with the Wisconsin State Laboratory of Hygiene.

1.3 Providing data to state and local health officers, academic researchers, and health care organizations across the state to foster partnerships in support of research transecting population and public health, community, and health care system domains.

SHOW's outreach focuses on support for leaders at the state, county, community, and neighborhood levels as well as academic researchers across the state.

- Prior to data collection in 2016, SHOW presentations were made to: the Western Regional WALHDAB (Wisconsin Association of Local Health Departments and Boards); the Waushara County health officer and staff; and to Brown County and DePere health officers and Brown County's Community Health Improvement Process steering committee. As a result, SHOW inserted new modules requested by these local health officers to support data collection on emerging health issues and/or content not otherwise available. New modules for Waushara and Brown Counties captured information on emergency preparedness and alcohol abuse in 2016. Health officers in Milwaukee County requested a module assessing key elements missing from their current community health needs assessment that was implemented in 2015 and 2016. We will continue to develop customized report content of SHOW data.
- SHOW staff will once again attend the annual Wisconsin Public Health Association meeting, in May 2017. PhD student Amy Schultz will be presenting on her work with Dr. Malecki on respiratory health outcomes among rural SHOW participants living near industrial dairy operations in Wisconsin.

- Preventive Medicine Fellow, Elizabeth Stein, MD, stationed at SHOW in 2016, collaborated with UW Health's Community Relations and Population Health Departments to evaluate how SHOW's Dane County data could contribute to community health needs assessment planning. She developed a report for *Healthy Dane* in Summer 2016. She used a stakeholder driven process to identify priority indicators for reporting to the group.
- SHOW continues to partner with the WPP-funded Obesity Prevention Initiative (OPI) to provide statewide and regional estimates of obesity based on physical measurements as well as data on a host of contributing factors such as physical activity, sleep and diet behaviors. In November, PhD student Shoshannah Eggers published a manuscript, *Obesity Prevalence and Health Consequences: Findings from the Survey of the Health of Wisconsin* in Wisconsin Medical Journal's special edition on OPI addressing obesity in the state. PhD student Elizabeth Holzhausen is also working to contribute SHOW data to a web-accessible dashboard being developed by the OPI for obesity surveillance in WI.
- Data on screening behaviors and risk factors for leading cancers experienced in SHOW participants living in the UW Carbone Cancer Center catchment area were provided for the center's May 2017 renewal application.
- Requests in the past year for data and/or analytic support from academic researchers for preliminary findings were met for two-dozen grant submissions including 10 to NIH with Drs. Nasia Safdar, Ajay Sethi; Mari Palta, Elizabeth Cox, Robert Lipinski, Matthew Tattersall, Christopher Bradfield; Co-Director Dr. Paul Peppard's Sleep in Children R01; and several applications submitted or planned with Co-Director Dr. Kristen Malecki.
- See Table 2 in Section 3 – Pertinent Information, for a full list of submitted applications.

Aim 2: Support data dissemination and educational initiatives for applied public health practitioners, faculty, and students interested in studies examining multi-layered determinants and outcomes of priority health conditions in the state by:

2.1 Generating and maintaining complex data systems and server capacity.

Annually, thousands of individual-level variables are reviewed for logical, processing, and data input errors and stored by unique study ID number in SHOW databases and datasets on secure servers. In the past year:

- Data delivery following the close of the 2015 data collection cycle was made by the UW Survey Center in February 2016.
- By September 2016, the 2015 SHOW Codebooks and datasets had been completed.
- Preparation for the 2016 SHOW Codebooks work is underway. The 2016 data collection cycle is about to close and data are anticipated from the UW Survey Center in April for subsequent processing by the SHOW data team through Summer 2017.

2.2 Making the data collection methods and survey protocols, data collection forms, data dissemination, and manuscript proposal policies available to students, faculty, and public health practitioners to facilitate data access and manuscript proposal development.

- The SHOW website (www.show.wisc.edu) continues to serve as a hub for information sharing with researchers, public health practitioners and students. Updates to the website continue in order to facilitate access and direct researchers, public health practitioners and students to relevant SHOW content. Content includes:

- i. Full-detailed codebooks, organized by topic, with response frequencies for each of the raw as well as derived data elements is available for review by interested researchers (<https://show.wisc.edu/data/>).
 - ii. Analytic guidelines and methodological best practices to aid public health practitioners around the state are also provided and made available upon request.
 - iii. Specific data release and publications policies are posted on the website to enable the collaboration between our program and the network of public health researchers across the state.
 - iv. The new SHOW Data Dissemination Portal, (www.show.wisc.edu/data/charts/), developed with input from public health practitioners across the state. Users can download high-resolution maps, figures and aggregated data. A key feature of the portal is the software design that will allow SHOW to readily add additional indicators and extend the time span in the future, for example following calculation of the 2014-2016 triannual sample weights at the close of 2016 codebooks work.
 - v. Several ancillary studies have taken advantage of the existing SHOW infrastructure as well as added to it (See **Appendix B** and Table 2, Section 3 – Pertinent Information, below).
 - vi. In addition, ancillary studies such as those developed by Kevin Thao, MD have used the SHOW model to develop their own research protocol and to document health outcomes and determinants among a general population of Hmong residents, the first of its kind in the nation.
- SHOW serves as a resource for mentoring UW students and fellows. In addition to hiring up to ten graduate and undergraduate students throughout UW Campus at any given time, SHOW supports student projects from a variety of programs throughout the UW-Madison campus including Sociology's Concentration in Analysis and Research (CAR) students and UW SMPH medical students. Educational engagements include providing datasets for analysis in graduate-level courses and partnering in the training of clinician-scientists. Additional highlights include:
 - i. 18 student projects using SHOW data have been on-going in the past year. A Population Health Sciences (PHS) program MS thesis was completed using SHOW data in summer 2016 by SHOW graduate student Jessica Gorzelitz-Liebhauser. PhD students from the Population Health Sciences graduate program (4), from the School of Nursing (1) and from Urban Planning (2) are using SHOW data in their dissertation work.
 - ii. Discussions are on-going with Population Health Sciences faculty teaching epidemiology, biostatistics and health services research and with the MPH-program for developing content based on SHOW data. Likewise, Population Health Sciences and Epidemiology graduate students from the department routinely seek SHOW data for course projects. Biostatistics and Medical Informatics graduate students used SHOW data during rotations with Dr. Mari Palta and with Dr. Ron Gangnon this past fall. An Economics graduate student also used SHOW insurance data for a project that has developed into an abstract and manuscript with Dr. Palta.
 - iii. SHOW partnered and provided letters of support to Family Medicine and Community Health and Biostatistics and Medical Informatics on their T32 proposals.

- iv. SHOW hosted Preventive Medicine fellow Elizabeth Stein, MD. Dr. Stein investigated the predictors of chronic disease in Veterans as well as mental health care service usage in Wisconsin residents using SHOW resources.
- v. SHOW participates in the Shapiro Summer Research Program for first year medical students. For example, mentoring by former SHOW Director, Dr. Javier Nieto resulted in SHOW publications on food insecurity and cardiovascular health.
- SHOW received 40 data requests in the past year and over 250 data requests to-date from partners within and beyond the University. The SHOW program offers a unique and novel resource for linking external data, such as green space and built environment, and potentially electronic health records with population-based health measures.
- Co-Director Dr. Malecki worked with a team of researchers from the US Environmental Protection Agency (EPA) and the Medical College of Wisconsin to link SHOW data with a model developed for “ecosystems services.” This model combines multiple evidence-based indicators about green space and the built environment compiled on a national scale. This project engaged students and fellows within the EPA as well as faculty from other academic institutions. Abstracts were presented at national conferences in the past year and publications are forth coming.

Aim 3: Provide a flexible, high quality, and cost-effective infrastructure that is responsive to changing health and research priorities in the state and supports a host of ancillary studies by:

3.1 Allowing researchers to access infrastructure resources or build on existing core data by adding modules and/or subsamples, or specialized instruments and clinical tests.

Since its inception, SHOW was developed to serve as a resource that is flexible enough to integrate hypothesis-driven as well as community-specific research through its ancillary study mechanism (See **Appendix B** as well as Table 2, below). Researchers have elected to add modules or measurements to the SHOW survey in several different applications including targeting a specific subpopulation within the core SHOW sample, conducting interdisciplinary research using the biorepository, and using our experienced research staff to carry out rigorous population-based research and evaluation protocols.

- OB/GYN and Urology's Dr. Heidi Brown developed an ancillary module of 13 questions that was incorporated into the existing audio computer-assisted self-interview (ACASI) portion of SHOW to support her research on adult incontinence in 2016. This module has remained in the 2017 core survey instrument to facilitate continued collaborations with Dr. Brown.
- The WARRIOR project, with PIs Dr. Nasia Safdar, Department of Medicine, and Dr. Ajay Sethi, Population Health Sciences, is examining the relationship between fiber-rich food intake and gut microbiota, the prevalence of intestinal colonization of multi-drug resistant organisms (MDRO) and the relationship between fiber intake with MDRO colonization. Conducted within SHOW, several new modules, new questions in existing modules, and new biological samples were implemented beginning in 2016. The project is on-going in 2017; 5 additional ancillary studies building on the WARRIOR-SHOW project and specimens have been proposed to-date, including an R01 proposal.
- SHOW is continuing to work with investigators from the School of Nursing and Industrial Engineering on the AHRQ-funded vizHOME project. Co-PIs Dr. Kevin Ponto and Dr. Gail Casper, with Co-Investigator Dr. Nicole Werner, developed an instrument to document features in homes that contribute to health information management, building on prior

vizHOME subprojects completed in partnership with SHOW. SHOW with support from the vizHOME team has trained the field team supervisor and a project coordinator as well as the field interviewers on the new semi-qualitative instrument in the Living Environments Laboratory at the Wisconsin Institutes for Discovery. The new instrument was pilot-tested with quality checks in the field, and is currently being implemented in participant homes.

- SHOW identified women of child-bearing ages from 4 subgroups (urban and rural; with and without indoor and outdoor pesticide exposure) for Veterinary Medicine's Dr. Robert Lipinski's proposal to NIH/NIEHS to examine the developmental toxicity of, and to determine population-based estimates of exposure to, a pesticide synergist and Hedgehog pathway inhibitor, piperonyl butoxide.
- Dr. Malecki proposes to use core survey data from both past and from newly recruited SHOW participants in 2018-2020 in combination with biorepository specimens to examine DNA methylation and XRE gene response.
- Three planned NIH grant submissions by Dr. Peppard and by Dr. Dilworth-Bart and Malecki, as well as a Microbiome Initiative application by Dr. Safdar, will build on SHOW's incorporation of children into the home-based survey, using SHOW's infrastructure to also collect biological samples from children (see Table 2 below).
- Dr. Mari Palta will resubmit a proposal to use: 1) SHOW's infrastructure to provide data collection for the Wisconsin Diabetes Registry Study cohort at 25-30 years' diabetes duration; and 2) SHOW data and biospecimens to serve as comparison in evaluating novel kidney disease biomarkers among non-diabetic SHOW participants.
- Dr. Laura Knoll and Dr. Dilworth Bart as well as Malecki proposed SHOW ancillary/pilot studies to the UW VCRGE Fall competition for pilot studies to gather preliminary data for future NIH awards.

3.2 Supporting resources and partnerships for conducting rigorous community-driven health assessments and evaluations of specific interventions aimed at addressing determinants of pressing health conditions for Wisconsin residents.

- SHOW continues to work with local health officers to plan for community-specific assessments and adding questions to SHOW on emerging health issues relevant to their health priorities. In 2014-2016 data collection cycles, topics selected for module inserts included: impact of alcohol and/or substance abuse (Ozaukee, Waushara, Brown Counties); emergency preparedness and response (Wood, Waushara, Milwaukee Counties); housing, participation in early childhood enrichment (Milwaukee), food sources (Brown) and dental health (Brown). County-level sampling weights have been prepared for 2014 and 2015 counties and the 2016 (2015-2016 for Milwaukee) weights will be generated following data processing for codebooks later this summer. This allows for customized report content of SHOW data, such as that generated in 2016 for *Healthy Dane* as well as *Sustain Dane*. This latter group is a non-profit that requested a summary on SHOW data for Dane County pertaining to connection to green space, healthy food, sense of community, and stress and discrimination.
- In Spring/Summer 2016, Dr. Corey Huck (UW-Stevens Point) in partnership with the Wood County Health Department requested information from SHOW's visit to Wood County in 2014 to illustrate key health issues for the county, aimed towards establishing a new community model ("Healthy Living Hub") for promoting healthy behaviors and preventing chronic disease with partners in Wood County.

- SHOW has contributed to programs promoting healthy eating in the community. Dr. Martinez-Donate and collaborators, including Amy Meinen with healthTIDE, published in 2016 results of the “Waupaca Eating Smart” healthy eating program in restaurants and supermarkets completed in partnership with SHOW. Sara Wright with the Winnebago County Health Department, also in partnership with Amy Meinen, submitted a WPP Community Impact Grant application last May for SHOW to support surveillance on a program to improve children’s healthy food consumption, “Healthy Children’s Meal in Wisconsin.”
- Urogynecologist, Dr. Heidi Brown is currently working with SHOW to inform on the potential reach and implementation of her community-based intervention work on continence promotion. In addition to supporting data collection on incontinence prevalence and workshop preferences, SHOW is supporting the prospective identification of women with incontinence who have not sought care for their condition. Dr. Brown is obtaining data to inform a future large-scale community-based randomized trial.
- Dr. Henry Anderson’s (DHS) studies of the impact of great lakes fish consumption have used SHOW’s research infrastructure for data and biospecimen collection in two previous data collection cycles. A third has been funded for a biomonitoring program among urban anglers living in proximity to Milwaukee Estuary Area of Concern waterways. SHOW will be responsible for recruitment, data collection and management, in addition to project coordination for this large project, slated to be completed in Summer 2017-Summer 2018. SHOW will also support data collection in a subset of Burmese Angler’s living in the Area of Concern.
- SHOW will be working with the new SMPH Center for Community Engagement and Health Partnerships director, Gina Green-Harris, and her staff in Milwaukee to enhance SHOW’s engagement in the Milwaukee area. Meetings with Ms. Green-Harris as well as with investigators at UW-Milwaukee Zilber School of Public Health are on-going for expanding the use of SHOW’s data and infrastructure by individuals in Milwaukee. Requests for information on SHOW data collection in Milwaukee have increased in the past year, including requests from the faculty at Zilber, and individuals from the American Heart Association, from the Center for Urban and Population Health, and the Northshore Health Department, for example.

2. Barriers/Research Plan Modifications

- We have made **no modifications to the Specific Aims from 3/1/2016-2/28/2017.**
- **Enhancement to our Research Plan.** In the past year, we have worked to implement **longitudinal follow-up exams** that includes a sample of approximately 700-900 prior (2008-2013) SHOW participants during the 2017 data collection cycle. To review, the reasons for longitudinal sampling in 2017 were threefold:
 1. **This approach harmonized the funding and sampling cycles.** We have just completed our three-year (2014-2016) sample, and have incorporated the longitudinal component to take place in 2017, prior to our next three-year sample beginning 2018.
 2. **This approach makes highly efficient use of SHOW staff resources.** SHOW is longitudinally resampling prior SHOW households (i.e., from those regions that participated in 2008-2013) in 2017 in the very regions that were sampled in 2016.

Among the 8 field interviewers employed for 2017, 6 were retained from 2016, minimizing expensive first-time hiring and training of 2017 field staff and providing SHOW with more experienced staff for the 2017 follow-up sample.

3. Foremost, SHOW will produce longitudinal data. For many scientific purposes, longitudinal follow-up data are more valuable than one-time cross-sectional data. Longitudinal data can be used to evaluate change-over-time, demonstrate feasibility of restudying SHOW subjects (important for writing grants that would propose to resample prior SHOW participants), and support grant applications that would benefit from longitudinal data.

- **Challenges** managed in 2016:

1. SHOW continues to face challenges with the staffing strategy introduced in 2014 that allowed local but temporary staff to be trained and hired to carry out data collection. Again, the new model has increased efficiencies, allowing the program to double annual sample size and include children; however, as completion of data collection in each county brings an end to the need for staffing in that county, staffing turnover has been a challenge, especially in the Milwaukee area. As stated above, our approach to longitudinal follow-up in 2017 allowed for retention of some 2016 staff.
 2. In 2016, 2 permanent SHOW phlebotomists were hired, one based at SHOW headquarters who travels and one located in Milwaukee, to support having qualified and responsible staff available for sample collection visits. We have subsequently noted an increase in our sample collection response rates overall, to 83%, up from 79% noted in 2015. However, we have also had continued difficulty in achieving high participation in sample collection visits, especially in Milwaukee (i.e., many participants agree to provide samples, but then do not show up for scheduled sample collection visits). While collecting samples for an ancillary study partner who requested targeted samples we noted participation to be lower (59% - 64%) among African American persons. This compares to 73%-78% for Milwaukee as a whole during that time. We noted double the number of no-shows for sample collection visits in this group over that experienced overall in Milwaukee, and triple that in other counties, during the same time-period. We have offered more in-home appointments as a result; 54% of the appointments among our African American participants were subsequently completed or scheduled as in-home visits.
- In response to these challenges we have posted a second permanent-staff position in Milwaukee this month. We feel a non-temporary, academic staff member working as a field interviewer in Milwaukee will provide additional stability to data collection in the county. We also plan for this individual to support community engagement efforts, with support from the new SMPH Center for Community Engagement and Health Partnerships. Director Gina Green-Harris will offer support to these efforts by providing guidance on engagement in addition to office space.

3. Pertinent Information

Staffing changes in the past year included last summer's departure of our part-time IRB and Ancillary Study Coordinator to attend graduate school full-time. Cross-training of existing staff, including support by staff from Dr. Peppard's Wisconsin Sleep Cohort Study have aided in the

management of this work. A second very recent change is the retirement of our long-term Field Team Manager, at the end of February 2017. Further adjustments in duties among existing staff along with new hiring are anticipated to meet SHOW's staffing needs.

In 2016, two SHOW phlebotomists were hired to the team in order to provide stability to the new staff model approach initiated in 2014 for temporary staffing in counties. We noted improved availability for sample collection visits with having 2 of our study phlebotomists (among 4) being permanent SHOW hires and more readily available for sample collection visits in 1) Milwaukee and 2) based at SHOW headquarters in Madison for travel across Wisconsin. These 2, 0.6 FTE phlebotomists will support ancillary study data collection when not collecting core survey data.

Grant submissions and associated partnerships that were funded, submitted, or under development in the past year are detailed in Tables 2A and 2B, below (spans several pages).

Table 2A: SHOW-based grants submitted and in pending status as of March 2017

Study	Funding source	PI(s)/institution or department (SHOW partner)	Description	Status/ Timing
Mechanistic analysis of how asymptomatic Toxoplasma infection prevents weight gain in animals fed high fat diet	UW2020	Knoll/ Dept Medical Microbiology and Immunology	The study will test whether latent Toxoplasma infection may cause a reduction in fat absorption and reduce BMI (uses SHOW biorepository).	Submitted 10/2016; Resubmitted to Microbiome Initiative 3/2017 Pending.
Social epigenomics of health disparities: how different dimensions of disadvantage get under the skin	UW2020	Malecki/ Engelman Sociology and Pop Health Sciences	SHOW existing data and biorepository will be used to study how different dimension of disadvantage shape health disparities through epigenetic mechanism (uses SHOW biorepository).	Submitted 10/2016 Pending.
Social epigenomics of health disparities	NIH R21	Malecki/ Pop Health Sciences	SHOW biorepository will be used to study DNA methylation in relation to aging across subpopulations with different socioeconomic, neighborhood and individual characteristics (uses SHOW biorepository).	11/2016 Pending. (NIH Review 3/28)
Fiber and the Human Gut Microbiota: a Longitudinal Investigation of Antibiotic Resistance	NIH R01	Safdar/Sethi Depts of Medicine, Infectious Disease and Pop Health Sciences	SHOW infrastructure will be used to recruit and collect data and samples to examine fiber intake and incidence of MDRO colonization and the relationship between fiber intake and gut microbiota.	Submitted 2/2017 Pending.
AHA Mentored Clinical and Population Research Award	AHA	Wilbrand/ Dept Neurological Surgery	The study will investigate cerebrovascular and cardiovascular disease risk factors to predict the rate of cognitive decline over time. SHOW will provide population-based controls.	Submitted 2/2017 Pending.

Study	Funding source	PI(s)/institution or department (SHOW partner)	Description	Status/Timing
A longitudinal investigation of objectively-assessed sleep, school start times, weight gain and metabolic outcomes in children	NIH, R01	Peppard/ Pop Health Sciences	SHOW will be used as an infrastructure to recruit children to study associations between sleep, obesity and metabolic disorders. SHOW will collect data using questionnaires, in-home polysomnography and blood spots for biochemical analysis.	Submitted 6/2016 Not funded. Resubmitted 2/2017 Pending.
Effectiveness of Portable Air-Cleaner in Reducing Allergic Response	EPA	Shafer/ Wisconsin State Lab of Hygiene	The goal of the project is to demonstrate the effectiveness of portable air cleaners to mitigate allergic respiratory disease. SHOW infrastructure will be use to recruit subjects diagnosed with asthma and to collect home environmental samples.	Submitted 2/2017 Pending.
Aryl Hydrocarbon Receptor Response as Sensor of Human Sensitivity to Toxins	NIH R01	Malecki/ Dept Pop Health Sciences	SHOW biorepository will be used to identify novel sensitive biomarkers of exposure and response to environmental toxins and to determine if gender, age, diet, and obesity mediate or modify the associations between cigarette smoke, DNA methylation, XRE gene response and systemic inflammation (uses SHOW biorepository).	Submitted 2/2017 Pending.
Envt Toxicant Exposures & Human Microbiota: Triclosan, Microbial Drug Resistant Organisms and Gut Microbial Diversity	ICTR pilot	Malecki/ Safdar Depts Pop Health Sciences and Medicine	The goal of this research is to gain further insight into the relationships between chronic triclosan exposure and the gut microbiota, how triclosan exposure influences MDRO colonization, and how these relationships differ between younger and older adults (uses SHOW biorepository).	Submitted 3/2017. Pending.
Developmental toxicity of pesticide synergist and Hedgehog inhibitor piperonyl butoxide	NIH/NIES R01	Lipinski/ Veterinary Medicine, Dept Comparative Biosciences	This study investigates the Hedgehog pathway in animal models and correlates developmental toxicity-associated PBO concentrations in the mouse with those in human (women of child-bearing age). SHOW biorepository will be used for this part of study. The goal is to provide a foundation for improved risk assessment.	Submitted 6/2015 Not funded. Resubmitted 3/2017 Pending.
Establishment of a Population-based Microbiome Research Core in the Survey of Health of Wisconsin	UW VCRGE	Sethi/ Pop Health Sciences	SHOW infrastructure and biorepository will be used to create a Population-based Microbiome Core (PMRC) that will provide the UW research community resources and expertise to conduct microbiome research	Submitted 3/2017 Pending.

Study	Funding source	PI(s)/institution or department (SHOW partner)	Description	Status/ Timing
Examining the Potential of the Microbiome in Children to Reduce Antibiotic Resistance: the EPIC Study	UW VCRGE	Safdar/ Depts Medicine and Infectious Diseases	SHOW infrastructure will be used to identify and enroll participants (children ages 3-5) during 2017-18 to study the structure and function of the nasal, skin, and gut microbiomes in children receiving care in daycare settings and compare the findings with the nasal, skin and gut microbiomes of children not receiving daycare.	Submitted 3/2017 Pending.

Table 2B: SHOW-based grants and partnerships funded, submitted (but not listed in Table 2A) or under-development in the current three-year award cycle

Study	Funding source	PI(s)/institution or department (SHOW partner)	Description	Status/ Timing
vizHOME	AHRQ R01	Brennan, Casper/IE, Nursing (Nieto)	SHOW is assisting in the identification and recruitment of households of diabetics to participate in a study of home barriers for diabetes care.	Funded - 2013-2018 On-going.
Vitamin D Clinical Trial	NIH, NIDDK R01	Engelman/PHS (Nieto)	An investigation to determine factors modifying the effect of vitamin D intake on vitamin D metabolites (uses SHOW biorepository)	R56 funded 10/2015. On-going.
Human Health Risks from Private Well Water in Wisconsin	WI Ground-water Coordinating Council	Anderson/DHS; Malecki/PHS	Study of private well owners' treatment and testing practices in the state. Findings will be used to improve health risk assessment of groundwater contamination in the state.	Funded July 2014; Completed October 2015.
Great Lakes Research Institute	EPA (Great Lakes Restoration Funds)	Werner, Kanarek/DHS (Malecki)	"Wisconsin's Assessment of Healthy Consumption of Great Lakes Fish"—support for design development and administrative support for recruitment, data collection and processing.	Funded – Data collection completed January 2016.
Obesity Prevention Initiative	PERC	Adams, Meinen, Remington/DFM (Nieto, Malecki)	Develop a statewide obesity prevention surveillance system. SHOW is a partner in the Obesity Prevention Initiative.	Funded; On-going.
Chronic Psychosocial Stress, and Risk of Metabolic Syndrome	CDE Pilot Grant	Bautista/PHS; Palloni/ Sociology (Malecki, Nieto)	Assess the usefulness of hair cortisol as a marker of chronic psychosocial stress by quantifying its association with self-reported stress, individual and neighborhood SES, and components of the metabolic syndrome. Data will be used to design of a follow-up SHOW-based cohort study.	Funded August 2014; Pilot data collection completed February 2016.
SHWAHP	Aspirin Health Foundation+ ICTR + additional sources	Thao/ Department of Family Medicine (Malecki)	Proposal to support the Survey of the Health of Wausau Hmong Population. Dr. Thao is using the SHOW model and questionnaires to develop a baseline survey of health amongst a Wausau area Hmong population. Partners include the Wausau Hmong Association, UW Stevens Point, and the UW DFM&CH	Funded; On-going data collection and support from SHOW.
Cumulative Impacts of Exposure to Multi-pollutant/Air Pollution Sources	Fall competition-UW campus	Malecki/PHS; Schauer/WSLH, Civil and Environmental Engineering	The goal is to understand the health impacts of exposure to multi-pollutant sources as well as the cumulative impacts of air pollution.	Funded; Submitted September 2014, On-going.

Study	Funding source	PI(s)/institution or department (SHOW partner)	Description	Status/Timing
WARRIOR	WPP collaborative health sciences grant	Safdar, Sethi/Medicine, PHS (Peppard)	The WARRIOR project will examine the relationship between fiber-rich food intake and gut microbiota, the prevalence of intestinal colonization of multi-drug resistant organisms and the relationship between diet fiber with colonization; to be conducted within the SHOW sample.	Funded. Submitted 6/2015; On-going.
Barriers and Facilitators to Physical Activity in Women in Rural WI	UW Dept. of Kinesiology and Virginia Horne Henry Fund pilot	Cadmus-Bertram/ Kinesiology; Malecki/PHS	SHOW infrastructure and data are being used for assessment of rural women's beliefs about barriers and facilitators to physical activity in Wisconsin, including a mail-based survey as well as qualitative component.	Funded. Submitted 2/2016. On-going.
Biomonitoring of Anglers in Milwaukee	Agency for Toxic Substances and Disease Registry (ATSDR)	Anderson/DHS; Malecki/PHS	SHOW will support biomonitoring of urban Anglers in Milwaukee's area of concern. SHOW will support sampling frame development and design, and provide support for recruitment, data collection and processing.	Funded. Submitted 2/2016. On-going.
A longitudinal investigation into associations of sleep duration and quality with measures of daytime function in children	UW VCRGE pilot	Peppard/PHS	The study will characterize sleep duration and patterns in children to measure association among sleep, social-emotional-behavioral outcomes and objectively measured alertness. SHOW infrastructure is used to recruit 40 children.	Funded. Submitted 9/2016
CREATE: Cumulative risks, early development and emerging academic trajectories	UW2020	Dilworth-Bart/ Human Development & Family Studies	Use SHOW field staff and expertise in household assessments to recruit up to 80 preschool age children and study cumulative social, environmental and inflammatory markers of risks to early child development. Will use SHOW administrative as well as field data collection expertise.	Funded. Submitted 10/2016
Lead (Pb), the Gut Microbiota, and Multi-Drug Resistant Organism (MDRO) Colonization	Dept. of Medicine Pilot	Safdar/Malecki Depts of Medicine and Infectious Diseases and Pop Health Sciences	SHOW data and biological samples in addition to WARRIOR microbiome data will be used to study MDRO colonization in gut and how gut microbiota is affected by exposures to lead (uses SHOW biorepository).	Funded. Submitted 12/2016.
Waupaca Eating Smart (WES)	WPP Community Opportunity Grant	Martinez-Donate/PHS (Malecki, Nieto)	Intervention for promoting healthy eating by enhancing and sustaining changes in the food environment in a WI community to increase access to healthy foods.	Submitted 3/2015; Not funded.
Human Aging Connectome Project (HACP)	NIH U01	Prabhakaran/ Medicine (Peppard)	The Human Aging Connectome Project (HACP) will use state-of-the-art imaging methods to measure connections between brain regions in adults.	Submitted 6/2015; Not funded.

Study	Funding source	PI(s)/institution or department (SHOW partner)	Description	Status/ Timing
Endocrine Disruptors and Obesity in Wisconsin	WPP New Investigator Award; NIEHS R21 or R01	Malecki/PHS	Social and biologic pathways that increase the risk for endocrine disrupting compounds and subsequent risk for metabolic dysfunction/obesity. (uses SHOW biorepository).	Submitted to WPP 2015; Not funded; <i>NIH submission planned.</i>
HRSA Primary Care Research Fellowship	HHS Training Grant	Rabago/Family Medicine and Community Health	SHOW will partner with the Department of Family Medicine and Community Health in training clinician-scientists through their HRSA Primary Care Research Fellowship.	Submitted 11/2015. Pending.
Strategies to Prevent and Reduce Kidney Stones	NIDDK U01	Penniston/Urology; LeCaire/PHS	SHOW will advice on study design, development of study education, and assessment materials and protocols for biospecimen handling and storage to Dr. Penniston's clinical center for the Urinary Stone Disease Research Network.	Submitted 11/2015. Not funded.
One in a Million – Wisconsin; Precision Medicine Initiative Cohort	NIH, U24	Brilliant/Marshfield Clinic Research Foundation	In partnership with the Marshfield Clinic Research Foundation and the Medical College of Wisconsin, SHOW and the UW SMPH will provide biorepository specimens, data, and linkage to EHR for participant across Wisconsin to contribute to NIH's Precision Medicine Initiative Cohort Program Biobank (uses SHOW biorepository).	Submitted 1/2016. Not funded.
Predicting Kidney Disease with Novel Markers in Early Type 1 Diabetes	NIH, NIDDK DP3	Palta, Astor, LeCaire, Peppard/PHS	SHOW's will collect data for the Wisconsin Diabetes Registry Study cohort at 25-30 years' diabetes duration as well as data and biospecimens among non-diabetic persons ("controls") in SHOW to evaluate novel kidney disease biomarkers. (uses SHOW biorepository).	Submitted 3/2016. Not funded. <i>Re-submission in preparation</i>
Health Behaviors and Chronic Disease in Wood County	Legacy Foundation of Central Wisconsin	Corey Huck, UW Stevens Point	Using SHOW resources to illustrate key health issues in Wood County and working towards establishing a new community model ("Healthy Living Hub") for promoting healthy behaviors and preventing chronic disease with community, academic and public health partners in Wood County	Submitted 3/2016. Not funded.
Community-Based Continence Promotion: SHOW Me the Reach	ICTR CAP D&I Research pilot	Brown/OB&GYN and Urology; Nieto/PHS	SHOW will identify older women with incontinence and query about their willingness to participate in a continence promotion program. SHOW will implement questions in the 2016 data collection cycle, support qualitative follow-up of women who have not sought care, provide data on incontinence and workshop preferences, and support data analysis.	Submitted 3/2016. Not funded. Project on-going with start-up funds.

Study	Funding source	PI(s)/institution or department (SHOW partner)	Description	Status/ Timing
Wisconsin Environmental Health Center Grant	NIH, NIEHS P30	Bradfield/Molecular Toxicology Center; Malecki/PHS	Develop a center that supports interdisciplinary environmental health research to improve mechanistic understanding of human susceptibility and variability with respect to environmental pollution (uses SHOW biorepository and infrastructure to support this center).	Submitted 5/2016. Not funded.
Healthy Children's Meals in Wisconsin	WPP Community Impact Grant	Wright/Winnebago Health Dept	The goal is to implement a program to improve the food environment for children in WI. SHOW will provide data to support the research and data analysis.	Submitted 5/2016 Not funded.
Identifying Actionable T1D Self-Management Barriers for Working-Age Adults	NIH/NIDDK DP3	Cox/Pediatrics	The overall goal of this research is to improve glycemic control and quality of life among working-age adults with type 1 diabetes. SHOW infrastructure will be used to obtain biosamples from 259 Wisconsin Diabetes Registry cohort members.	Submitted 6/2016 Not funded.
Cumulative Risks, Early development And emerging academic Trajectories (CREATE)	NIH R21	Dilworth-Bart/SoHE; Schauer/CoE; Malecki/PHS	Interdisciplinary investigation to study effects of cumulative social and environmental risks on child development and school readiness in lower income (<200% of poverty) preschoolers; using the SHOW research infrastructure.	<i>In preparation, submission planned for 2017.</i>

4. Additional Requested Information

Below, we describe advancements in the metrics specified in the notice of award.

a. Number and description of applications/proposals to leverage additional funding, both successful and unsuccessful.

Since March of 2015, **31** grant applications have been submitted in partnership with SHOW; **23** of these submissions came in the past year, since March 2016.

- **7** applications have been funded, including an R56 with the NIH/NIDDK, one with the Wisconsin Partnership Program, one by the CDC/ATDSR and 4 were funded by pilot mechanisms internal to UW-Madison.
- **12** applications are pending notification of review, including **6 Federal applications** (NIH, EPA) (among 10 Federal applications submitted in total in the past year) and 1 other extramural application (American Heart Association).

A tabular description of the proposals is provided in Table 2A and 2B, Section 3, above.

b. Number and nature of outreach activities to engage researchers across the UW SMPH and the University, including basic scientists and clinicians, in use of SHOW data and biospecimens.

- In November of 2015, SHOW created a new 0.5 FTE Researcher and Grant Facilitator position devoted to outreach primarily surrounding grant proposals building on SHOW's resources (see section 4.f, below).
- Since 2016, approximately 60 distinct meetings and communications have taken place (primarily in-person meetings with SHOW staff) with both academic researchers and applied public health practitioners with the goal of initiating and facilitation of SHOW-based grant applications, investigations, or other types of partnerships.
- Since January 2016 we have made 28 presentations on SHOW and SHOW-based research across the campus and at national scientific meetings and we are constantly looking for new opportunities to present SHOW.
- There have been 40 new data requests for SHOW core data in the past year, including data for publications, presentations, 11 student or postdoctoral scientist project requests, and preliminary, pilot or ancillary study-linked data for on-going or new SHOW-related grants.
- Co-directors Drs. Malecki and Peppard have met with three faculty or faculty spousal hire recruitment candidates interested in the potential for collaborating with SHOW or using SHOW data should they be hired at UW-Madison. All showed great interest in SHOW.
- SHOW's Data Dissemination Portal to our website and subsequent announcements across the state continues to elicit contact by individuals interested in SHOW data (this Portal is described in more detail in section 4.f, below).
- In 2016 we conducted a targeted email outreach with investigators on the UW-Madison campus selected based on their research interests.
- We continue to seek outreach opportunities for SHOW across the campus and state.
- See **Appendix C** for a chronological listing of these outreach activities, as well as **Appendix D** for SHOW presentations made, including with local health officers and their staff. Our Researcher's Brochure is at the end of Appendix D.

c. Number and titles, authors and abstracts of publications with increasing proportion of authorship by individuals not employed by SHOW.

- There have been 12 peer-reviewed publications in the past year to which SHOW contributed core data or infrastructure support to.
- 4 additional manuscripts have been submitted or are very near submission as of this progress report.
- 12 additional manuscript proposals were approved by the SHOW publication committee in the past year.
- Less than one-third (8 of 27) of the manuscripts or manuscripts proposals described in the 3 prior bullets are first-authored by scientists employed by SHOW.

- In the past year, 15 abstract submissions and/or scientific presentations have been made.
- See **Appendix D** for the list of SHOW publications, abstracts, presentations and media hits since March 2015.

d. Data on utilization of SHOW's biorepository.

The number of grant submissions leveraging SHOW's biorepository continues to increase; in the current cycle, 10 of the applications submitted proposed the use of this unique resource. Four other applications will contribute additional samples to SHOW's biorepository. Pilot testing with samples in the SHOW biorepository continues to provide preliminary data for grant applications.

Applications using, or proposing to use, the SHOW biorepository are indicated in the tabular description of the proposals provided in Section 3, Table 2, above ("Description" column, indicated, in bold, by "uses SHOW biorepository").

e. Impact or outcomes of SHOW's collaborations on health, such as the results of SHOW's work with local health agencies.

- SHOW's new model of triannual data collection directly responds to previous concerns expressed by health officers of a lack of community specific and local data available to practitioners. Since 2014, SHOW has worked with 9 local health officers to plan for community specific assessments and adding questions to SHOW relevant to their health priorities. Topics selected for module inserts include: impact of alcohol and/or substance abuse (Ozaukee, Waushara, Brown Counties); emergency preparedness and response (Wood, Waushara, Milwaukee Counties); housing, participation in early childhood enrichment (Milwaukee); food sources and dental health (Brown).
- SHOW's ongoing data collection has been identified as an important surveillance tool for tracking health status and determinants in Wisconsin. This is evidenced by: 1) SHOW's contribution to the statewide Obesity Prevention Initiative (OPI, also funded by WPP) surveillance and evaluation team; and 2) through SHOW's infrastructure, OPI's August 2016 Wisconsin Medical Journal publication included two articles building from SHOW's work – "*Obesity, Prevalence and Health Consequences*", by graduate student Shannah Eggers, et al; and "*Residential Disparities in the Restaurant Food Environment: Evidence from the Assessing the Nutrition Environment in Wisconsin Communities Study*" by Dr. Ana Martinez-Donate, et al. Other examples include the previously described SHIP project.
- SHOW continues to provide novel data for other applied public health programs and has provided core content for surveillance reports (available upon request). Projects include: 1) The State of Oral Health Report published by DHS ([The Oral Health of Wisconsin Adults, 2015](#)); 2) Vulnerability of Private Well Owners in the State of Wisconsin; 3) State Health Implementation Planning.
- SHOW is increasingly seen as a valuable resource by applied practitioners for analytic support and add-on studies. A salient example is State Representative Corey Mason and his team's application for a US Housing and Urban Development multi-million dollar grant for the Racine Promise Zone. SHOW provided important baseline data as well as analytic support for the application, and was proposed to provide a critical evaluation arm for the project.

- SHOW continues to collaborate with several ongoing health partners in the state. One example is our work with the UW Health System and Public Health Madison & Dane County on their Community Health Improvement Planning. Preventive Medicine Resident, Elizabeth Stein, MD, stationed at SHOW for 2015-2016, worked with UW Health's Community Relations and Population Health Departments to evaluate how SHOW's Dane County data may contribute to community health needs assessment planning for *Healthy Dane*.
- Health Officer Sara Wright of Winnebago County partnered with SHOW on a Community Impact Grant application for promotion healthy eating in children. Dr. Corey Huck, Associate Professor in Health Promotion and Wellness with UW-Stevens Point (UWSP) previously submitted a pilot grant to use SHOW resources (our data analysis team and Wood County data) to illustrate key health issues in Wood County, towards establishing a new community model ("Healthy Living Hub") for promoting healthy behaviors and preventing chronic disease with partners in Wood County (UW-Stevens Point School of Health Promotion and Human Development, South Wood County YMCA and the Wood County Health Department).
- Our data analysis team is continuing to work on dedicated time for providing reports to counties that SHOW has visited in our current triannual sample. Our new interviewer/community engagement specialist in Milwaukee will facilitate discussions with local health officers and support other community engagement efforts.

f. *Developing specific plans for SHOW as a "shared resource" to engage other investigators in the University.*

SHOW was originally conceived to be – and has been maintained as – a shared resource for University of Wisconsin investigators. Sections 4 a-d, above, attest to this. However, emphasis on this shared resource role has been elevated in the current award in two primary ways, described below.

First, in November 2015, a new staff position was filled by Dr. Maria Nikodemova as Researcher and Grant Facilitator. Dr. Nikodemova is a PhD physiologist with a MS in Population Health Sciences. Her role (as outlined in the position vacancy listing for her position), supports the mission of SHOW to facilitate transdisciplinary research by a diverse group of University of Wisconsin investigators. Major activities of the position include:

- Working closely with the SHOW directorship to engage new investigators on the UW campus and beyond in order to collaborate in the development of grant applications.
- Promoting and developing the use of SHOW's research infrastructure and biorepository in new grant submissions and awards by investigators on and off the UW-Madison campus.
- Assisting in development of research methods with a diverse set of investigators (basic science, clinical, population-level and translational researchers) that intersects their research interests with SHOW methods and resources.
- Working with SHOW Directorship to develop methods for engaging investigators in order to promote grant applications, with the ultimate objective of collaborating in grant writing and submissions.
- Working with investigators on budget development and grant oversight requirements including Institutional Review Board submissions and grant-required reports.

- Collaborating in the development of data instruments, preparing data for analysis, and analyzing SHOW data in support of investigators' grant applications.
- Assisting with protocol development and implementation regarding the collection, processing and storage of biospecimens, and supporting the management of the SHOW biorepository and its database.

Second, using resources provided by the UW ICTR dissemination pilot program, SHOW created a Data Dissemination Portal, publically released March 1, 2016. The portal (www.show.wisc.edu/data/charts/) was created to visualize changes in over 40 key health indicators, initially selected and compiled from the thousands of variables in SHOW's database. It was built using open source tools that allow for interactive data exploration.

- The portal was developed using stakeholder input from a newly established SHOW Stakeholder Advisory Board (SAB) that included over 9 state public health practitioners.
- Prospective UW investigators, as well as other Wisconsin health stakeholders (e.g., public health officers) can download high-resolution maps and figures along with the aggregated data.
- As of March 17, 2017, the portal has been visited by 2068 users.

Over the past year, we developed a pilot program to improve the tracking of SHOW's research output. The SHOW Output Tracking System (SHOTS) will bring together information on meetings with faculty, grant development, data requests, paper and poster presentations, scholarly publications, community outreach, and graduate student mentoring. SHOTS is built on the idea of connecting information that already exists in spreadsheets maintained by the SHOW biostatistician, ancillary coordinator, research and grant facilitator, and publications committee. The SHOTS pilot began with research into existing technologies such as lab information management systems (Electronic Lab Notebooks, REDCap), software collaboration tools (Basecamp, Jira), and grant management systems (Kuali Coeus). None of these workflows fit with SHOW because we wanted a program to facilitate research at every stage: planning, ongoing follow up, and cataloging results. Therefore, the SHOW data team and database administrator are customizing existing open source software to create a program that gathers the particular information that SHOW needs for tracking and increasing shared research activities.

Appendix A – SHOW Biorepository Description

The SHOW biorepository provides storage and distribution of biospecimens for research purposes and establishes procedures that ensure adherence to human subject ethical review, confidentiality, quality, safety, and other regulatory standards and best practices. The biorepository has been established in order to provide specimens for examination of the multi-dimensional mechanisms leading to wide range of diseases including, but not limited to, cardiovascular, metabolic, respiratory, cancer, and sleep disorders as well as being able to correlate these results with an array of environmental and physiologic components of disease development and sequelae. The biorepository includes aliquoted serum, plasma, and urine specimens, as well as extracted and stored DNA samples for each subject.

Beginning in 2016, stool and saliva specimens collected by SHOW for microbiome analysis by the Wisconsin Partnership Program funded partners, the WARRIOR project, were stored in a separate -80°C freezer as a resource for future SHOW-WARRIOR ancillary partners.

The current inventory of samples collected through February 2017 is as follows:

	2008	2009	2010	2011	2012	2013	2014	2015	2016	TOTAL
Participating Subjects	198	296	853	802	389	379	411	559	591	4,478
Serum aliquots	1,884	2,743	8,643	8,698	4,659	4,698	3,970	5,982	5,884	47,161
Plasma aliquots	2,853	3,720	10,728	11,132	5,888	6,025	4,997	7,002	7,184	59,529
Urine aliquots	2,515	4,017	12,442	12,686	5,534	5,474	5,265	7,108	8,275	63,316
Whole blood (PaxGene)							354	504	524	1,382
DNA (blood or saliva)	103	272	819	781	377	378	388	532	568	4,218
WARRIOR - stool									508	508
WARRIOR - saliva									552	552

SHOW samples are stored in -80°C freezers maintained in facilities near SHOW headquarters, including 4 that reside within the state-of-the-art University of Wisconsin School of Medicine and Public Health's (UWSMPH) Freezer Farm Facility located in the *Wisconsin Institutes for Medical Research (WIMR)*. Central to campus, and nearest to SHOW headquarters, 5 additional freezers reside in the McArdle Laboratory for Cancer Research, slated as the next UWSMPH Freezer Farm Facility. SHOW serum and plasma specimens are stored as 0.5 ml aliquots and the urine as 1.5 ml aliquots. Freezers are equipped with an alarm system that notifies SHOW staff. The Rees alarm system (Rees Scientific V2 Direct Sequence Spread Spectrum Universal wireless transmitter / Temperature Probe Type 4 -90 to -10 Degrees) is supported through the UWSMPH facilities in WIMR. A separate system is managed by UW-Madison campus for McArdle freezers, however in May 2017 a Rees system will be set up to monitor SHOW freezers in McArdle as well. A written Standard Operating Procedure defines the procedures to be taken in response to freezer alarms including the identification of backup freezers to assure transfer and continued safe storage of the biospecimens.

DNA samples are managed and stored through a subcontract with Prevention Genetics, LLC (Marshfield, WI—see below). Prevention Genetics provides the storage as well as genotyping of both multiallelic and diallelic polymorphisms. This ability leads to cost-effective DNA testing as well as secure samples and data. Prevention Genetics works with SHOW to assure labeling, tracking, and storage of samples are maintained as set forth in the written procedures.

DNA is extracted using the method of Ciulla et al.¹ This process results in an average of 400 micrograms / 20 cc of donated blood sample. The DNA obtained from this process can be used for many downstream application including PCR, Long-range PCR, sequencing and epigenetic analysis (such as DNA methylation). Internal testing at Prevention Genetics has already demonstrated that samples processed in this manner are stable at -80°C for at least 10 years. The DNA stock material is stored in Matrix tubes that have a pre-printed 2D code on the bottom, which hold more information in less space than the barcodes and serve as a secondary identification of the sample.

¹ Ciulla TA, Sklar RM, Hauser SL. A simple method for DNA purification from peripheral blood. *Analytical Biochemistry* 1988;175:485-488.

Appendix B – SHOW Ancillary Studies

Completed Ancillary Studies, March 2015 – present

Study	Collaborators	Summary
Great Lakes Fish Consumption Study 'Anglers II'	Henry Anderson, Wisconsin Department of Health and Family Services	This two-year project proposal seeks to design and implement a fish advisory intervention in clinics to facilitate individual dietary changes and corresponding reductions in exposure to toxic contaminants from consumption of Great Lakes fish among Lake Superior Basin residents. This project builds upon DHS's current GLRI sport fish consumption project and experience gained in Minnesota addressing similar issues on the north shore of Lake Superior. This intervention will include training for health care providers, a patient screening tool to assess fish consumption, testing of hair for mercury content, screening for emerging toxicants, and education for participants and the general public.
Chronic Psychosocial Stress and Risk of MetS (Hair Cortisol) Pilot	Alberto Palloni, and Leonelo Bautista, UW Graduate School, Ctr for Demography Pilot Grant	This project assessed the usefulness of hair cortisol as a marker of chronic psychosocial stress (CPS), by quantifying its association with self-reported stress, individual and neighborhood SES, and components of the metabolic syndrome (MetS). Data from this study will be used to design of a cohort study of the effects of SES on CPS and MetS in SHOW.
Groundwater Research Project	Wisconsin Groundwater Coordinating Council, Kristen Malecki	Private well owners in the state of Wisconsin are at greatest risk for exposure to groundwater contamination because their water is unregulated. Private well testing is an evidence-based intervention that can help private well owners know if they have a groundwater quality problem and if they need to treat their wells. The Department of Natural Resources in Wisconsin estimates only 10% of private well-owners test their wells. Wisconsin private well owners represent approximately 1/3 of the population. The SHOW sample also includes approximately 1,000 residents on private wells (about 1/3 of the total SHOW sample). This project is a follow-up survey of private well owners regarding private well testing practices and barriers to private well testing. This study will support future health based risk assessments as well as identify possible solutions for improving private well testing rates in the state.
Sleep in Kids Pilot	Paul Peppard, Population Health Sciences, Vilas Award Funding	Preliminary data collected from SHOW children participants by polysomnography for comparison with actigraph and self-reported sleep data previously collected by SHOW, for future R01. The R01 will comprehensively characterize sleep duration and quality including objective measurement by actigraphy in children, to understand associations between sleep and several sleep domains associated with short-term and long-term health and well-being, including weight and metabolic profile, behavior and social functioning and academic outcomes; using SHOW infrastructure.
ID-SHOW Improving Dissemination of SHOW Data	Kristen Malecki, UW Institute for Clinical and Translational Research	Timely dissemination of key health indicators has been shown to affect policy decisions at the local health department level. This grant from ICTR will enable translation of SHOW findings into improvements in public health. Wide availability of SHOW data will aid in addressing health disparities and advancing community health by increasing knowledge and providing rigorous data for evaluation, targeted decision-making and policy action.

Ongoing Ancillary Studies, March 2015 – present

Study	Collaborators	Summary
Wisconsin Environ. Exposure Pilot Study (WEEPS)	Chris Bradfield, Molecular and Environmental Toxicology Center	The WEEPS project expands existing biospecimen testing completed in the first phase of the pilot to include mRNA testing from existing SHOW participants' biorepository specimens and SHOW Core data to evaluate environmental exposures and biomarker response. This work continues to serve as preliminary work for developing a novel Environmental Health Center at the University of Wisconsin with collaborator Chris Bradfield.
EPHT	Wisconsin Environmental Public Health Tracking program	The CDC funded EPHT program aims to advance environmental health surveillance nationwide by analyzing urine samples from a representative sample of Wisconsin adults. No other such study has been conducted on a population based sample. The primary goals of this study will be to assess the distribution in exposure of state residents to cadmium, arsenic, mercury and uranium and compare these distributions to levels found nationally.
vizHOME	Patricia Brennan; Kevin Ponto, Gail Casper, UW College of Engineering and School of Nursing	The purpose of this project is to systematically determine how household context shapes personal health information management (PHIM). PHIM encompasses a suite of cognitive and behavioral tasks that people undertake to accomplish their health goals, including: recording symptoms; communicating with clinicians; determining when and how to reorder medications; monitoring health states; and making sense of discharge summaries, health-related web sites and clinician-provided handouts.
SHWAHP	Kevin Thao, UW Family Medicine, Wausau Area Hmong Association, UW Stevens Point	This project is the Survey of the Health of Wausau Area Hmong Population. Dr. Kevin Thao from the Dept. of Family medicine is working with SHOW to design a community based assessment of health in the Hmong community. Seed funding for this pilot has been awarded by the Aspirus Health Foundation.
WARRIOR	Nasia Safdar Medicine, Ajay Sethi, Population Health Sciences	The WARRIOR project examines the relationship between fiber-rich food intake and gut microbiota, the prevalence of intestinal colonization of multi-drug resistant organisms (MDRO) and the relationship between fiber intake with MDRO colonization in 600 SHOW subjects.
Vitamin D	Corinne Engelman, Population Health Sciences	This project will provide information on vitamin D exposure and genotypes in a population-based sample, including in African American individuals, in preparation for a placebo-controlled randomized clinical trial to determine the efficacy of genotype-guided vitamin D supplementation.
Physical Act. in Rural WI Women	Lisa Cadmus-Bertram, Kinesiology	SHOW will partner in this assessment of rural women's beliefs about barriers and facilitators to physical activity in Wisconsin, including a mail-based survey as well as qualitative component.
REACH	Heidi Brown, Obstetrics & Gynecology/Urology	Using a new module added to the SHOW core survey, this project uses SHOW to estimate the prevalence of urinary and bowel incontinence as well as preferences on delivery format for a continence promotion program, Mind Over Matter; Healthy Bowels, Healthy Bladder (MOM), in a representative sample. Implementation of the module allows SHOW to identify women with incontinence who have not sought care for evaluating barriers/facilitators of participation in MOM by qualitative interview.
Anglers III	Henry Anderson, Jon Meiman, WI Dept. of Health Services;	This project will implement a biomonitoring program to evaluate body burden of both legacy and emerging contaminants among anglers residing in the Milwaukee Estuary Area of Concern (AOC) community.
Lead and Microbiome Diversity	Nasia Safdar,; Shannah Eggers, Kristen Malecki, Dept of Medicine Pilot Funding	This project will investigate lead in SHOW biorepository samples for SHOW/WARRIOR participants who provided stool samples for multidrug resistant organism (MDRO) analysis. The project will also utilize SHOW core and WARRIOR risk factor data, such as diet, as well as use GIS to calculate proximity to roadways for these individuals.

<p>Daytime Functioning and Sleep in Children Pilot</p>	<p>Paul Peppard, Erika Hagen; VCRGE Fall Competition Funding</p>	<p>This project will pilot data collection on social-emotional-behavioral outcomes and alertness testing as a measure of alertness, as related to sleep duration and quality in SHOW children. This pilot data will serve as preliminary findings for R01 submissions by Drs. Peppard and Hagen.</p>
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Appendix C – SHOW Outreach

Outreach Activities, March 2015-present (current grant-year activities in bold)

DATE	INVESTIGATOR	SCHOOL/DEPARTMENT	NATURE OF OUTREACH	TOPICS
3/2015	Brad Astor	SMPH, Medicine (Nephrology)	Personal meeting	Predicting diabetes in kidney transplant patients
3/2015	Corey Huck	UW Stevens Point	SHOW contacted via web portal	Planning for SHOW Wood County data use
3/2015	Nasia Safdar	SMPH, Medicine (Infectious Disease)	Personal meeting	MDRO colonization
4/2015	Adnan Said	SMPH, Medicine (Gastroenterology/Hepatology)	Personal meeting	Non-alcoholic fatty liver disease (NAFLD)
5/2015	Randy Brown	SMPH, Family Medicine	Personal meeting	Alcohol use and neighborhood characteristics
5/2015	Robert Lipinski	Veterinary Medicine, Comparative Biosciences	Personal meeting	Population based estimates of exposure to the pesticide synergist piperonyl butoxide (PBO)
5/2015	Vivek Prabhakaran	SMPH, Radiology	Personal meeting	Aging Connectome
5/2015	Aaron Carrel	SMPH, Pediatrics	Personal meeting	Pediatric fitness
5/2015	Brian Christens	Human Ecology, Civil Society & Community Studies	Personal meeting	Childhood obesity
6/ 2015	Kevin Thao	SMPH, Family Medicine	Personal meeting	Hmong Survey of Health in WI
6/2015	Juli Aulik and Mary Michaud	UW Community Health & DHS	Personal meeting	Planning for SHOW Dane County data use
7/2015	Jennifer Russ	DHS	Phone conference	Data for SHIP group

DATE	INVESTIGATOR	SCHOOL/DEPARTMENT	NATURE OF OUTREACH	TOPICS
9/2015	Corinne Engelman	SMPH, Population Health Sciences	Personal meeting	Vitamin D study
9/2015	Marguerite Burns	SMPH, Population Health Sciences	Personal meeting	Discussion of using SHOW data in the PHS program's HSR course.
10/2015	Kristina Penniston	SMPH, Urology	Personal meeting	Kidney stone registry, Urology research network
10/2015	David Rabago	SMPH, Family Medicine and Community Health	Personal meeting	HRSA Primary Care Research Fellowship (Training grant)
10/2015	Heather Johnson	SMPH, Medicine (Cardiovascular Medicine)	Personal meeting	Cardiovascular diseases
11/2015	Lisa Cadmus-Bertram	L&S; Kinesiology	Personal meeting	Questions on sedentary behavior to add, R21 grant possibility
11/2015	Brooke Thompson, Henry Anderson	DHS	Personal meeting	Plans to discuss grant submission when RFA is released
11/2015	Maureen Smith	SMPH, Population Health Sciences, Health Innovation Program	Personal meeting	Plans to present at AQORN Seminar
11/2015	Mari Palta	SMPH, Population Health Sciences	Personal meeting	Plans for NIDDK grant submission
12/2015	Aleksandra Zgierska	SMPH, Family Medicine	Personal meeting	Prescription medications for pain control and misuse
12/2015	Heidi Wendell Brown	SMPH, OB/GYN & Urology	Personal meeting	ICTR D&I pilot
1/2016	Marc Drezner	SMPH, Medicine, ICTR	Personal meeting	Precision Medicine Initiative
1/2016	Zsuzsa Fabry	SMPH, Pathology and Molecular Medicine	Outreach by e-mail , personal meeting	Introducing SHOW, discussing presenting SHOW at department seminar

DATE	INVESTIGATOR	SCHOOL/DEPARTMENT	NATURE OF OUTREACH	TOPICS
1/2016	Kimberly Gretebeck	School of Nursing	Outreach by e-mail, personal meeting	Interested in SHOW infrastructure
1/2016	Mark Wegner	DHS	Personal meeting, presentation	Meeting with the DHS Medical Leadership Team
1/2016	Tracy Schroepfer	School of Social Work	Outreach by e-mail	SHOW introduction
2/2016	Elisa Torres	School of Nursing	Outreach by e-mail	SHOW introduction
2/2016	Earlise Ward	School of Nursing	Outreach by e-mail	SHOW introduction
2/2016	Lisa Bratzke	School of Nursing	Outreach by e-mail	SHOW introduction
2/2016	Tova Walsh	School of Social Work	Outreach by e-mail	SHOW introduction
2/2016	Judith Bartfield	Inst Research on Poverty	Outreach by e-mail	SHOW introduction
2/2016	Jason Fletcher	Inst Research on Poverty	Outreach by e-mail	SHOW introduction
2/2016	Corina Burger	Dept Neurology	Outreach by e-mail	SHOW introduction
2/2016	Ruth Benedict	Dept Kinesiology	Outreach by e-mail	SHOW introduction
2/2016	Shannon Sparks	Human Development and Family Studies	Outreach by e-mail	SHOW introduction
2/2016	Samantha Perry	<i>Racine Lifecourse Initiative for Healthy Families</i> , Racine Kenosha Community Action Agency	SHOW contacted via web portal	SHOW data for Racine and Kenosha counties

DATE	INVESTIGATOR	SCHOOL/DEPARTMENT	NATURE OF OUTREACH	TOPICS
2/2016	Sue Kunferman	Wood County Health Department	SHOW contacted via web portal	Wood county- specific data
2/2016	Jayme Schlenk	Marquette County Health Department	SHOW contacted via web portal	Inquired if SHOW is coming to Marquette county
2/2016	Carol Meagher	Chippewa County Department of Public Health	SHOW contacted via web portal	Wanted to know how counties are selected to be a part of SHOW and what is the cost for Health
2/2016	Michael Quirke	DHS, Wisconsin Division of Mental Health and Substance Abuse Services	SHOW contacted via web portal	Inquired if any correlations have been run on the statewide data as to which of the indicators go together
2/2016	Justin Svingen	Public Health Madison & Dane County	SHOW contacted via web portal	Requested a presentation of SHOW at the Healthy Places Learning Group meeting
2/2016	Carol Meagher	Chippewa County Department of Public Health	SHOW contacted via web portal	Inquired whether Chippewa County can be part of SHOW
3/2016	Barb Duerst	SMPH, Population Health Sciences, MPH Program	Personal meeting	Requested meeting to discuss the use of SHOW data in a core course of the MPH program
3/2016	Penny Black	Wisconsin Office of Rural Health	SHOW contacted via web portal	Requested meeting to discuss SHOW and possibility to use SHOW data
5/2016	Christopher Bradfield	WID; Molecular & Environmental Tox. Ctr.	Personal meeting	SHOW infrastructure, biorepository and data as collaborator for Environmental Center grant for Personalized Toxicology
5/2016	Sarah Wright	Winnebago County Health Dept. and HealthTide	SHOW contacted via web portal	SHOW to support surveillance of childrens food environment in Winnebago County/Fox Valley

DATE	INVESTIGATOR	SCHOOL/DEPARTMENT	NATURE OF OUTREACH	TOPICS
5/2016	Adnan Said	SMPH, Internal Medicine	Personal meeting	Discussing comparison of clinic patient data with SHOW (control) data
6/2016	Elizabeth Cox	SMPH, Pediatrics	Personal meeting	Grant collaboration; SHOW proposed to obtain data for WDRS cohort members
8/2016	Jennifer Reinhart	School of Veterinary Medicine	SHOW contacted via web portal	Inquiry on medications and adverse reactions data available.
8/2016	Olayinka Shuyanbola	School of Pharmacy	SHOW contacted via web portal	Interested in data for African Americans diagnosed with T2DM in the state and on oral medication use
8/2016	Elisa Torres	School of Nursing	SHOW contacted via web portal	Interested in the PHQ8 instrument and data for African Americans
8/2016	Cory Steinmetz	UW-Milwaukee, Zilber School of Public Health	Personal meeting	Interested in SHOW data available for Milwaukee Health Report
9/2016	Paul Rathouz	SMPH, Biostatistics	Personal meeting	Training Grant: Cardiovascular and Pulmonary Biostatistics
9/2016	Yang Sao Xiong	School of Social Work	Personal meeting	Support for data management/handling of SHWAHP project
9/2016	Amy Kalkbrenner	UW-Milwaukee, Zilber School of Public Health	SHOW contacted via web portal	Interested in using SHOW data for coursework
9/2016	Kristin Thorleifsdottir	CALS; Landscape Architecture	SHOW contacted via web portal	Interested in SHOW/WASABE data for possible grant opportunity
9/2016	Mari Palta	SMPH, Pop Health Sciences	Personal meeting	Data for student project
9/2016	Ron Gangnon	SMPH, Pop Health Sciences	Personal meeting	Data for student project

DATE	INVESTIGATOR	SCHOOL/DEPARTMENT	NATURE OF OUTREACH	TOPICS
9/2016	Mustafa Hussein	UW-Milwaukee, Zilber School of Public Health	SHOW contacted via web portal	Inquiry on using SHOW data for future analyses and manuscript work
9/2016	Annette Paul	Aurora Bay Care, Green Bay	SHOW contacted via web portal	Inquiry on SHOW data, resources
9/2016	Katherine Curtis/Malia Jones/Michal Engelman	UW Center for Demography and Ecology	Meeting re: collaborative R21 participation	Inquiry re: use of SHOW data for environmental demography seminars as well as future R21 collaborations
10/2016	Matthew Tattersall	SMPH, Medicine	Personal meeting	Career development award; use of SHOW infrastructure, data on controls for asthma and CVD project
10/2016	Reka Sundaram-Stukel	DHS & SMPH/PopH	SHOW contacted via web portal	Interested in working with SHOW data for manuscript
10/2016	Jacquelyn Kulinski	Medical College of Wisconsin	SHOW contacted via web portal	Inquiry on process for using SHOW data and for adding research questions
10/2016	Wei Xu	UW-Milwaukee	SHOW contacted via web portal	Inquiry on data available for caregiving behaviors
10/2016	Jamie Lynch	St. Norbert College, Sociology, Strategic Research Institute	SHOW contacted via web portal	Inquiry on data/possible collaboration with SHOW
11/2016	Amber Canto	UW-Extension, Cooperative Extension	SHOW contacted via web portal	Inquiry on data available for evaluation of SNAP-Ed Framework
11/2016	Kris Baughman	Northeast Ohio Medical University	SHOW contacted via web portal	Inquiry on data available for children for evaluating school and health disparities using spatial analysis

DATE	INVESTIGATOR	SCHOOL/DEPARTMENT	NATURE OF OUTREACH	TOPICS
11/2016	Anne Traynor	UW Carbon Cancer Center	SHOW contacted via web portal	Inquiry following K. Malecki SHOW presentation to UWCCC
11/2016	Emery Bresnick	The Cancer Genetics and Epigenetics program	Personal meeting	Inquiry on collaborations possible with SHOW following presentation KM made to UWCCC
11/2016	Marwa Bassiouni	UW Carbon Cancer Center	SHOW contacted via web portal	Data for Cancer Center Support grant
11/2016	Kelsey Baubie	UW Nelson Institute	Personal meeting	Discussed possibility of SHOW data linkage to air pollution data
11/2016	Alice Ammerman	University of North Carolina at Chapel Hill	SHOW contacted via web portal	Inquiry on data available for evaluation of SNAP-Ed Framework
12/2016	Megan Elderbrook	DHS, Chronic Disease Prevention Program	Personal meeting	Inquiry on using SHOW data for evaluating data for CDC grant
12/2016	James Schauer	College of Engineering	Personal meeting	Inquiry on collaboration with SHOW for EPA grant
12/2016	Martin Shafer	Wisconsin State Laboratory of Hygiene	Personal meeting	Inquiry on collaboration with SHOW for EPA grant
1/2017	Barbara King	School of Nursing	Personal meeting	Potential interest in pilot study with linking UW EHR for SHOW ppts using UW for health care.
1/2017	Sapna Gangaputra	NIH	Personal meeting	Faculty candidate visiting from NIH, interested in opportunities for developing research projects with SHOW if hired to UW
1/2017	Vera Tsenkova	Institute on Aging	SHOW contacted via web portal	Potential interest in SHOW data for preliminary data for R21 submission and possible manuscript on occupational physical activity and gluoregulation

DATE	INVESTIGATOR	SCHOOL/DEPARTMENT	NATURE OF OUTREACH	TOPICS
1/2017	Chooza Moon	School of Nursing	Personal meeting	Inquiry on using SHOW data
1/2017	Stephanie Wilbrand	SMPH, Neurological Surgery	Personal meeting	Inquiry on using SHOW data/infrastructure for Mentored Research Award with AHA
1/2017	Stephanie Shelton	SMPH, Pop Health Sciences	Personal meeting	Interest in working with SHOW/GIS opportunities
1/2017	Betsy Rolland	UW Carbone Cancer Center	Personal meeting	Inquiry on data for UW CCC catchment area for Cancer Center grant
1/2017	Jiawei Bai	Prospective faculty hire in Biostatistics and Medical Informatics	Personal meeting	Discussed potential use of SHOW data for research should Dr. Bai be hired at UW
2/2017	Amy Cochran	Prospective spousal hire/faculty or scientist in an SMPH department	Personal meeting	Discussed potential use of SHOW data for research should Dr. Cochran be hired at UW
3/2017	Ivy Cheung	Prospective spousal hire/post doc in an SMPH department	Personal meeting	Discussed potential use of SHOW data for research should Dr. Cheung be hired at UW
3/2017	Elizabeth Leslie	Faculty candidate in Medical Genetics	Personal meeting	Discussed use of SHOW for work to understand genetic variants in the SHOW population as part of faculty recruitment efforts.
3/2017	John Denu	Director of Epigenetics, Faculty - Wisconsin Institute of Discovery	Personal communication	Inquiry on use of SHOW resources for WID –Big Idea initiative

Appendix D – SHOW Publications, Presentations and Press Hits

Publications, March 2015 – present (current grant-year activities in bold)

1. **Beyer KM, Malecki KM, Hoormann KA, Szabo A, Nattinger AB. Perceived Neighborhood Quality and Cancer Screening Behavior: Evidence from the Survey of the Health of Wisconsin. Journal of Community Health 2016; 41(1):134-7. PMID: 26275881**
2. Brennan P, Ponto K, Casper G, Tredinnick R, Broecker M. Virtualizing living and working spaces: Proof of concept for a biomedical space-replication methodology. Journal of Biomedical Informatics, 2015; 57:53-61. PMID: 26173040
3. **Bhutani S, Schoeller DA, Walsh MC, McWilliams C. Frequency of Eating Out at Both Fast-Food and Sit-Down Restaurants Was Associated With High Body Mass Index in Non-Large Metropolitan Communities in Midwest. American Journal of Health Promotion. 2016 Aug 28;0890117116660772. PMID: 27574335**
4. **Casper GR, Brennan PF, Arnott Smith C, Werner NE, He Y. Health@Home Moves All About the House! Stud Health Technol Inform. 2016;225:173-7.PMID: 27332185**
5. Casper GR, Flatley Brennan P, Perreault JO, Marvin AG. vizHOME--A context-based home assessment: Preliminary implications for informatics. Stud Health Technol Inform. 2015;216:842-6. PMID: 26262170
6. **Christensen KY, Raymond MR, Thompson BA, Anderson HA. Fish Consumption, Levels of Nutrients and Contaminants, and Endocrine-Related Health Outcomes Among Older Male Anglers in Wisconsin. Journal of Occupational and Environmental Medicine. 2016 Jul 1;58(7):668-75. PMID:27253230**
7. Christensen K, Thompson B, Werner M, Malecki K, Imm P, and Anderson H. Levels of nutrients in relation to fish consumption among older male anglers in Wisconsin. Environmental Research 2015 142: 542-548. PMID: 26296180
8. **Christensen KY, Thompson BA, Werner M, Malecki K, Imm P, Anderson H. Levels of persistent contaminants in relation to fish consumption among older male anglers in Wisconsin. International Journal of Hygiene and Environmental Health 2016. 219(2):184-94. Epub 2015 Nov 10. PMID: 26614251**
9. **Christensen KY, Raymond M, Thompson BA, Anderson HA. Perfluoroalkyl substances in older male anglers in Wisconsin. Environment International 2016; 91:312-318. Epub 2016 March 19. PMID: 27003842**
10. Dykema J, Jaques K, Cyffka K, Assad N, Hammers R, Elver K, Malecki K, Stevenson J. Effects of Sequential Prepaid Incentives and Envelope Messaging in Mail Surveys. Public Opinion Quarterly. October, 2015: nfv041.
11. **Eggers S, Remington PL, Ryan K, Nieto FJ, Peppard PE, Malecki KM, Obesity Prevalence and Health Consequences: Findings From the Survey of the Health of Wisconsin, 2008-2013 WMJ 2016; 115(5):238-241.**
12. Escaron AL, Martinez-Donate AP, Riggall AJ, Meinen A, Hall B, Nieto FJ and Nitzke S. Developing and Implementing “Waupaca Eating Smart” A Restaurant and Supermarket

- Intervention to Promote Healthy Eating Through Changes in the Food Environment. Health Promotion Practice 2016; 17(2):265-77. Epub 2015 Nov 5. PMID: 26546508
13. Givens ML, Malecki KC, Peppard PE, Palta M, Said A, Engelman CD, Walsh MC, Nieto FJ. Shiftwork, sleep habits, and metabolic disparities: results from the Survey of the Health of Wisconsin. Sleep Health: Journal of the National Sleep Foundation 2015; 1(2):115-120. PMID: 26894229
 14. Laxy M, Malecki K, Givens M, Walsh M, Nieto F. The association between neighborhood economic hardship, the retail food environment, fast food intake, and obesity: findings from the Survey of the Health of Wisconsin. BMC Public Health. 2015; Mar 13;15:237. PMID: 25885908
 15. Malecki K, Wisk LE, Walsh M, McWilliams C, Eggers S, Olson M. Oral health equity and unmet dental care needs in a population-based sample: findings from the Survey of the Health of Wisconsin. Am J Public Health. 2015 Jul;105 Suppl 3:S466-74. Epub 2015 Apr 23. PMID: 25905843
 16. **Martinez-Donate AP, Espino JV, Meinen A, Escaron AL, Roubal A, Nieto FJ, Malecki K. Neighborhood Disparities in the Restaurant Food Environment. WMJ. 2016; 115(5):251-258**
 17. **Mathur, MB, Epel E, Kind S, Desai M, Parks CG, Sandler DP, Khazeni N. Perceived stress and telomere length: A systematic review, meta-analysis, and methodologic considerations for advancing the field. Brain, Behavior, and Immunity. In press. (2016). doi:10.1016/j.bbi.2016.02.002 PMID: 26853993**
 18. **Raymond MR, Christensen KY, Thompson BA, Anderson HA. Associations Between Fish Consumption and Contaminant Biomarkers With Cardiovascular Conditions Among Older Male Anglers in Wisconsin. Journal of Occupational and Environmental Medicine. 2016 Jul 1;58(7):676-82. PMID: 27253229**
 19. **Saiz AM, Aul AM, Malecki KM, Bersch AJ, Bergmans RS, LeCaire TJ, Nieto FJ. Food insecurity and cardiovascular health: Findings from a statewide population health survey in Wisconsin. Preventive Medicine. 2016 Dec 31;93:1-6. PMID: 27612573**
 20. **Schultz AA, Schauer JJ, Malecki KM. Allergic disease associations with regional and localized estimates of air pollution. Environmental Research. 2017 May 31;155:77-85. PMID: 28193558**
 21. Shin J, Bautista L, Walsh M, Malecki K, Nieto F. Food insecurity and dyslipidemia in a representative population-based sample in the US. Prev Med. 2015 Aug;77:186-90. Epub 2015 May 22. PMID: 26007296
 22. Wahowiak L. Wisconsin partners create retail toolkits for healthier eating. The Nation's Health, 2015 45(2):9. American Public Health Association.

Presentations/Abstracts¹, March 2015 – present (current grant-year activities in bold)

1. **Bajwa P, Gudnadottir U, Bersch A, LeCaire T, Peppard P, Malecki K. The Survey of the Health of Wisconsin: A Resource for Monitoring Health and Supporting Research in Wisconsin Communities. Population Health Sciences Annual Poster Series, University of Wisconsin, Madison. April 2017.**
2. **Cadmus-Bertram L, Malecki K, Peppard P, Engelman C, Grabow M, Martinez-Donate A, Bersch A. Physical Activity and Neighborhood Characteristics: Findings from the Survey of the Health of Wisconsin (SHOW). Society of Behavioral Medicine Annual Meetings, Washington, DC, March 2016.**
3. Eggers S, Gangnon R, Malecki K. Urbanicity and Bicycle Helmet Use; Findings from the Survey of the Health of Wisconsin. Poster presentation: Population Health Sciences, Welcome Day Poster Session, University of Wisconsin-Madison. March 23, 2015.
4. Eggers S, Gangnon R, Malecki K. Urbanicity and Bicycle Helmet Use; Findings from the Survey of the Health of Wisconsin. Poster presentation: Society for Epidemiologic Research Annual Meeting, Denver, Co. June 16, 2015.
5. **Eggers S, Remington P, Ryan K, Nieto F, Peppard P, Malecki K. Obesity Prevalence and Health Consequences: Findings from the Survey of the Health of Wisconsin 2008-2013. Department of Population Health Sciences, Spring Poster Session, UW Madison. April 4, 2016. ***Student Poster Award.**
6. **Eggers S. Obesity Prevalence and Health Consequences: Findings from the Survey of the Health of Wisconsin, 2008-2013. Working Together to prevent Obesity in Wisconsin/WiPOD meeting. Madison, WI, April 13, 2016.**
7. Frenette P, Gundadottir U, Gorzelitz J. Survey of the Health of Wisconsin Updates and Outreach – Wisconsin Public Health Association Conference. Wisconsin Kalahari Dells. May 2015
8. Grabow M, Malecki, K, Engelman C, Peppard, Martinez-Donate A, Bergman E, Bernardinello M, Patz, J. What Moves Us: A Comparison of Perceived and Objective Predictors of Active Transportation Behaviors. Oral Presentation. Moving Active Transportation to Higher Ground: Opportunities for Accelerating the Assessment of Health Impacts. Washington, D.C. April 13, 2015
9. **Halling M, Beyer K, Nieto F, Malecki K. Embodied stress: Pathways between neighborhood environment and increased cardio-metabolic risk. American Public Health Association (APHA) Annual Meetings, Denver, CO. Nov 1, 2016.**
10. LeCaire T, Nikodemova M. Survey of the Health of Wisconsin Overview, Outreach and Updates. Western Regional Wisconsin Association of Local Health Departments and Boards (WALHDAB) Meeting and Eau Claire County Health Department. Jan 2016.
11. LeCaire T, Nikodemova M. Survey of the Health of Wisconsin Overview, Outreach and Updates. Waushara County Health Department. Feb 2016.
12. LeCaire T. Survey of the Health of Wisconsin Overview, Outreach and Updates. Brown County Health Department and Brown County Community Health Improvement Steering Committee Meeting, Feb 2016.

13. LeCaire T, Nikodemova M. SHOW, a resource for Population Health Research. WiSOR, WI Surgical Outcomes Research Program. UW Madison, August 22, 2016.
14. LeCaire T. SHOW as an Infrastructure for Researchers. UWCCC Internal Staff Meeting. UW Madison, November 28, 2016.
15. LeCaire T. Research Opportunities with the Survey of the Health of Wisconsin. School of Nursing. UW Madison, March 7, 2017.
16. Malecki K. SHOW as an Infrastructure for Researchers. Population Health Institute All Staff Meeting. UW Madison, April 12, 2016.
17. Malecki K. SHOW as an Infrastructure for Researchers. UW-CCC Leadership. UW Madison, November 11, 2016.
18. Malecki K. The Social and Environmental Ecology of Health: Findings from the SHOW. Weston Roundtable Series, Nelson Institute. UW Madison, November 17, 2016.
19. Malecki K. Disentangling Poverty, Race and Place: Findings from the SHOW. Institute for Research on Poverty. UW Madison, December 15, 2016.
20. Malecki K. SHOW Overview. GEM (Genetic and Epigenetic Mechanisms), WIMR (Wisconsin Institutes for Medical Research). UW Madison, March 10, 2017.
21. Malecki K, Bergmans R, LeCaire T, Palta M. Cumulative Health Impacts of Chronic Exposure to Fine Particulate Matter and Neighborhood Perceptions of Crime on Pulmonary Health: Results from the Survey of Wisconsin. Oral Presentation, 143rd Annual Meeting & Exposition of the American Public Health Association, Chicago, IL, October 31 – November 4, 2015.
22. Malecki K, LeCaire T. Learn about health services research using SHOW. Health Innovation Program. UW Madison, December 16, 2016.
23. Malecki K. SHOW Overview. Department of Family Medicine. UW Madison, March 15, 2017.
24. Malecki K, Nieto F. The Survey of the Health of Wisconsin Updates and Focus on Milwaukee and Ozaukee Counties in 2015. Southeast Regional Wisconsin Association of Local Health Departments and Boards. Milwaukee, Wisconsin. April 8, 2015.
25. Malecki K, Nieto F. The Survey of the Health of Wisconsin Updates and Focus on Polk County in 2015. Polk County Health Department, April 23rd, 2015.
26. Malecki K, Nieto F. The Survey of the Health of Wisconsin Updates and Focus on Ozaukee County in 2015. Ozaukee Public Health Department, April 30th, 2015.
27. Malecki K, Schultz A, Severtson L. Reducing human health risks from groundwater: Estimating private well testing behaviors and water use among private well owners in Wisconsin. Groundwater Coordinating Council Meeting, Madison, WI, November 20, 2015.
28. Malecki KMC, Schultz A, Bergmans R, LeCaire T, Palta M. Cumulative Health Impacts of Chronic Exposure to Fine Particulate Matter and Neighborhood Perceptions of Crime on Pulmonary Health. Results from the Survey of the Health of Wisconsin. Poster Presentation. International Society for Environmental Epidemiology. Sao Paulo, Brazil. September 2, 2015.
29. Malecki KMC, Schultz A, Bergmans R, LeCaire TF, Palta M. 2015. Cumulative Health Impacts of Chronic Exposure to Fine Particulate Matter and Neighborhood Perceptions of Crime on Pulmonary Health. In: Abstracts of the 2015 Conference of the International

- Society of Environmental Epidemiology (ISEE). Abstract [number]. Research Triangle Park, NC: Environmental Health Perspectives; <http://dx.doi.org/10.1289/ehp.isee2015>, August 31, 2015.
30. Malecki KMC, Schultz A, Severtson, DL, Vanderslice, J, Anderson, HA. Understanding Chemical and Non-chemical Vulnerability of private well owners: Results from the Survey of the Health of Wisconsin. Poster Presentation. International Society for Environmental Epidemiology. Sao Paulo, Brazil. September 1, 2015.
 31. Malecki KMC, Schultz A, Severtson, DL, Vanderslice, J, Anderson, HA. Understanding Chemical and Non-chemical Vulnerability of private well owners: Results from the Survey of the Health of Wisconsin. Poster Presentation. Poster presented at the 143rd Annual Meeting & Exposition of the American Public Health Association, Chicago, IL, November 4, 2015.
 32. Malecki KMC, Schultz A. Disentangling Race and Place: Association of Chronic Fine Particulate Matter Exposure, Racial Segregation and Pulmonary Health. Oral Presentation. International Society for Environmental Epidemiology. Sao Paulo, Brazil. September 3, 2015.
 33. Martinez-Donate AP, Valdivia Espino J, Meinen A, Escaron A, Roubal A, Nieto FJ, Malecki K. Disparities in the restaurant food environment: Evidence from the Assessing the Nutrition Environment in Wisconsin Communities (ANEWC) Study. Oral paper presented at the 143rd Annual Meeting & Exposition of the American Public Health Association, Chicago, IL, October 31 – November 4, 2015.
 34. Moehr M. Quantifying the loss of information due to geomasking in health survey data. Spatial Information for Human Health: Spatial the un-conference. Interdisciplinary Humanities Center, University of California, Santa Barbara, CA, December 9-11, 2015.
 35. Nieto F. The Survey of the Health of Wisconsin Updates and Focus on La Crosse County in 2015. La Crosse Public Health Department, May 5th, 2015.
 36. **Nikodemova M. Survey of the Health of Wisconsin: a Tool for Health and Social Disparity Research. BREAD (Bias Research to Promote Equity and Diversity), Center for Womens Health. UW Madison, February 9, 2017.**
 37. Nikodemova M, LeCaire T. Survey of the Health of Wisconsin: A Resource for Population Health Research. UW Madison Health Innovation Program's Access, Quality and Outcomes Research Network (AQORN), University of Wisconsin School of Medicine and Public Health. Feb 2016.
 38. **Nikodemova M, LeCaire T. SHOW as an Infrastructure for Researchers. School of Veterinary Medicine, Faculty Meeting. UW Madison, November 16, 2016.**
 39. **Nikodemova M, LeCaire T. SHOW, a resource for Population Health Research. Pathology and Laboratory Medicine Faculty meeting. UW Madison, May 17, 2016.**
 40. **Nikodemova M, Frenette P, LeCaire T, Neito FJ, Peppard PE, Malecki KM. SHOW: a Research Resource for UW Faculty, Staff & Student Investigators. PHS Welcome Day Poster Session. Population Health Sciences, UW Madison, April 4, 2016.**
 41. **Nikodemova M, Frenette P, LeCaire T, Neito FJ, Peppard PE, Malecki KM. SHOW: a Research Resource for UW Faculty, Staff & Student Investigators. Working Together to prevent Obesity in Wisconsin/WiPOD meeting. Madison, WI, April 13, 2016.**
 42. **Nikodemova M, Frenette P, LeCaire T, Neito FJ, Peppard PE, Malecki KM. SHOW: a Research Resource for UW Faculty, Staff & Student Investigators. PHS Welcome Day Poster Session. Population Health Sciences, UW Madison, April 3, 2017.**

43. Schultz A, Malecki K. **Concentrated animal feeding operation air emissions & respiratory health effects among WI residents.** Society for Epidemiologic Research Congress of the Americas Conference. Miami, FL, June 21, 2016.
44. Schultz A, Malecki K. **Concentrated Animal Feeding Operation Air Emissions & Respiratory Health Effect.** The International Society for Environmental Epidemiology (ISEE), Rome, Italy, September 2016.
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47. Schultz A, Gagnon, R, Schauer J, Malecki KMC. Fine Particulate Matter and Allergies and Asthma. Results from the Survey of the Health of Wisconsin. Poster Presentation. International Society for Environmental Epidemiology (ISEE). Sao Paulo, Brazil. September 2, 2015.
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49. Spahr C. **The built environment and health: the role of placemaking in physical activity.** Association of Collegiate Schools of Planning (ACSP) 56th Annual Conference, Portland, OR, November 3, 2016. Abstract: 426
50. Stein E, Bersch A, Parvathy P, Remington P, Nasia S Peppard P. Chronic disease risk factors among male veterans with a history of combat exposure—Survey of the Health of Wisconsin, 2010-2013. American College of Preventive Medicine Annual Conference, Washington, DC. Feb 26, 2016.
51. Stein E. **SHOW data for 2014 from Dane County.** Healthy Dane. Madison, WI, April 7, 2016.
52. Valdivia Espino J, Meinen A, Escaron A, Roubal A, Nieto FJ, Malecki K, Martinez-Donate AP. Disparities in the food store environment: Evidence from the Assessing the Nutrition Environment in Wisconsin Communities (ANEWC) Study. Oral paper presented at the 143rd Annual Meeting & Exposition of the American Public Health Association, Chicago, IL, October 31 – November 4, 2015.
53. Yang, A, Olson, M, Malecki, K. Oral Health of Wisconsin Adults: Findings from the Survey of the Health of Wisconsin. Poster Presentation at the Council for State and Territorial Epidemiology Annual Meeting. Boston, MA. June 2015.
54. Yee J, Pete G, Aaron Vo, Zhang X, Johnson BP, Mezrich JD, Kennedy GD, Bradfield CA, Malecki K. Profiling of an AHR Response in Whole Blood. Poster presented at Society of Toxicology Meeting. March, 2015.
55. Yngve L, Beyer KMM, Malecki KM, Jackson L. **Street-scale green infrastructure and physical activity.** International Society for Environmental Epidemiology (ISEE) Conference, Rome, Italy in September 2016.

56. Yngve L, Beyer KMM, Malecki KM, Jackson L. The association between green neighborhood environments and active transportation. Transport and Health Conference, San Jose, CA in June 2016.

¹ No PERC funds have been used for international travel—and only minimal funds have been used for travel for national conferences that has been mostly supported by outside grants, faculty development grants, or other discretionary funds.

SHOW Press / Media Hits, March 2015 – present (current grant-year activities in bold)

Press Hits: March 2015-present		
Date	Paper	Headline
May 17, 2015	dailyRx	<u>How the Night Shift Might Affect Your Health</u>
May 27, 2015	www.safetyandhealthmagazine.com	Shift workers more likely to have metabolic, sleep issues:
June 3, 2015	WIZM FM Radio	Surveyors Investigating Health in La Crosse
June 4, 2015	http://www.india.com/	<u>Working in shifts can cause disorder in sleep patterns</u>
June 6, 2015	www.amerymedicalcenter.org	Statewide health survey coming to Polk County in July
June 18, 2015	WLUM Ozaukee	Ozaukee Focus of Public Health Survey
June 19, 2015	Courier Life Newspaper in Onalaska / Holmen	Study to Shed Light on County Health
June 25, 2015	WNOV-AM	Study to Survey Health in Milwaukee County
June 27, 2015	WKBT-TV	UW Researchers Look at Health Trends in La Crosse
June 29, 2015	News.wisc.edu	Cost, Lack of Insurance Coverage are Primary
June 29, 2015	WUWM Lake Effect Radio	Survey of the Health of Wisconsin works in Milwaukee
July 2, 2015	County Ledger Press	Study to Shed Light on Health in Polk County
July 5, 2015	WLWK-FM	UW Researchers Visit Milwaukee
July 18, 2015	La Crosse Tribune	UW Survey to Focus on County's Health

Press Hits: March 2015-present		
Date	Paper	Headline
December 9, 2015	CITYLAB of the Atlantic	How to Market Healthy Food in a Rural Town
May 18, 2015	Medical News Today	Shift Work linked to Sleep Problems and Poor Metabolic
June 29, 2015	UW SMPH News	Cost, Lack of Insurance Coverage are Primary
February 8, 2016	UW SMPH News	Survey of the Health of Wisconsin Shares Health
April 27, 2016	Eau Claire Leader Telegram	EC County Survey to Glean Health Data
April 27, 2016	WEAU TV – Eau Claire	EC Households Urged to Participate in State Health
May 9, 2016	WRPN Radio	Waushara Families Invited to Join State Public Health Research Study.
May 19, 2016	USA Today	550 Families Involved in Health, Habits Project
May 21, 2016	Green Bay Press Gazette	Green Bay Families to Participate in Health Survey
December 12, 2016	Wisconsin Public Radio	Survey Finds State Obesity Rate Higher than Previously
December 13, 2016	Superior Telegram	Survey Finds State Obesity Rate Higher than Previously
December 15, 2016	Wisconsin Public Television	Survey Finds Wisconsin’s Obesity Rate Higher than
February 1, 2017	Health Sense	Obesity Rates in Wisconsin Higher Than Previously

SHOW Other Dissemination of Project Results, March 2015 – present

SHOW Data Dissemination Portal: Released to Public on March 1, 2016 to-date, 2068 users.

The SHOW Data Dissemination portal (www.show.wisc.edu/data/charts/) was created to visualize changes in over 40 key health indicators, initially selected and compiled from the 3,000 variables in SHOW’s database. It was built using open source tools (www.highcharts.com) that allow for interactive data exploration. Public health officers can download high-resolution maps and figures along with the aggregated data. The software design will allow SHOW to add additional indicators and extend the time span without needing any changes in the code.

Important features include:

- Built with open source interactive data visualization tools (www.highcharts.com)
- SHOW can add more data any time we want without changing any of the code
- Allows public health officers to download aggregate data or export the charts.

As of March 17, 2017, the portal has been visited by **2068 users**.

SHOW's BIOSPECIMEN PROGRAM

SHOW's biorepository is a collection of serum, plasma, urine, and DNA samples that are available for investigation of health research questions.

Fasting blood samples are used for immediate analysis of blood cell counts, hemoglobin, hematocrit, platelet count, HbA1c, glucose, creatinine, total and HDL cholesterol and triglycerides.



SHOW currently collects the following samples from adult participants:

- Serum, plasma and urine samples aliquoted and stored in freezers at -80°C in a central biorepository.
- DNA – extracted from whole blood (or alternatively from saliva) - aliquoted and stored in freezers at -80°C.
- SHOW will be adding stool and saliva samples to the biorepository for the years 2016 and 2017.

Using SHOW's biospecimens: To learn more about using biological specimens for your research, contact us at 888-433-7469, or at researchers@show.wisc.edu.

EXAMPLES OF SHOW PROJECTS

The SHOW infrastructure has been used by UW (university-wide, including SMPH), as well as State government and other external investigators to:

- Examine the relationship between fiber-rich intake and gut microbiota and the prevalence of intestinal multi-drug resistant organisms (the "WARRIOR Study")
- Develop a baseline health assessment amongst Hmong population in Wausau area
- Identify and recruit households of persons with diabetes to participate in the "vizHOME Study" of home barriers for diabetes care
- Perform school-based interventions and assessment of BMI, physical activity and built environment to prevent obesity
- Implement pilot studies for future grant applications including an exploration of the correlation between self-reported stress, hair cortisol and biological markers of inflammation
- Study private well owners' treatment and testing practices in the state
- Perform interventions to promote healthy eating by enhancing and sustaining changes in the food environment in order to increase access to healthy foods
- Assess angler's fish consumption patterns and knowledge regarding current fish advisory programs for mercury and PCBs; Biological samples were tested for mercury, PCB, selenium and omega 3-fatty acids levels
- Perform in-home polysomnography (sleep studies) on a sample of 30 SHOW children for preliminary data to support an NIH R01 application

Connect with us to start your research inquiries today!

researchers@show.wisc.edu

888-433-7469

www.show.wisc.edu



Comprehensive annual examination survey of the health of Wisconsin residents since 2008

Funded by the Wisconsin Partnership Program, SHOW is a research infrastructure – available to faculty, research staff, students and public health professionals for a broad range of health research, evaluation & monitoring activities.



**School of Medicine
and Public Health**
UNIVERSITY OF WISCONSIN-MADISON



DOING RESEARCH WITH SHOW

The Survey of the Health of Wisconsin is a novel, statewide infrastructure for population health data collection that is modeled on the US CDC's National Health and Nutrition Examination Survey. Wisconsin is the first in the nation collecting state-wide health data together with an extensive biological sample bank that supports basic and applied population health research programs. SHOW has collaborated on over 20 research projects with teams from all over the country.

SHOW can offer:

- **Identification of a SHOW-based subject sample using existing data on exposures and outcomes or samples from the biorepository**
- **Management of recruitment and screening of participants for new SHOW or outside research projects**
- **Adding questions or a module to the survey**
- **Collect specialized environmental and biological specimens**
- **Support with SHOW IRB, protocols and grants submissions and reports**

DATA SHOW COLLECTS

SHOW is an annual survey of the Wisconsin population with objective measures of health determinants and outcomes. Survey data and biological samples are available for public health inquiries as well as new research investigations. SHOW has been collecting data annually since 2008. SHOW includes:

- Household-based examination survey
- Representative sample of state residents and communities
- A growing cohort of over 5,000 participants, adults and children
- In-person interviews with 2,000 questions
- Individual, household and community level data collection
- Objective measures of weight, blood pressure and physical activity
- Limited cognitive testing
- Biorepository with plasma, urine and DNA samples. Saliva and stool samples are being added in 2016
- Measures of environmental data including the social and built environment

Physical Measurements

For adults:

- Objective physical activity and sleep by accelerometry (waist and wrist-worn devices measure rest/activity cycles for seven days)
- Blood pressure and heart rate
- Anthropometry: measuring height, weight, waist, hip and arm circumference
- Respiratory function using a portable peak flow meter (spirometry)

For children:

- 3-6 years: height, weight
- 6 years and up: objective physical activity and sleep (accelerometry), height, weight, waist, hip and arm circumference, blood pressure, respiratory function.

Questionnaire Data

SHOW collects hundreds of health-related variables from each adult participant in the survey and more limited questionnaires for children participants. The following list covers the range of topics in SHOW questionnaires.

Full information about SHOW questionnaires, variables, and codebooks are available at <https://show.wisc.edu/data/>. A brief auto-access registration is required.

Sociodemographics: Age, gender, race/ethnicity, education, socioeconomic status, military experience, occupation

Health and Health Care: Health history, medication use, preventative health, immunization history, cardiovascular health, sensory and dental health, reproductive health, cognitive function, respiratory health/spirometry, health insurance, health care access and utilization

Mental Health Conditions/Outcomes:

Depression, PTSD, quality of life, stress, stressful life events

Health-Related Behaviors: Alcohol use, diet and meal sources, sleep, smoking, caregiving, physical activity, screen time, safety habits, contraception

Community Environment:

Urban/suburban/rural, built environment, economic hardship, discrimination, food Insecurity, sense of community, groundwater, housing, traffic use/density, air quality, neighborhood perceptions