There are microorganisms living all over the human body—around it and within it. They are so abundant, in fact, that the human body houses trillions of bacteria, viruses and fungi. Together, this microbial community comprises the human microbiome.

Why study the microbiome?

A growing body of research suggests that our microbiomes play an important role in keeping us healthy and can provide clues about many health conditions.

Many factors can affect the composition and function of the human microbiome including exposures in the environment, genetics, and diet, for example. If we can better understand the links between these factors and a healthy microbiome, we may be able to improve the public's health.

One important and growing public health threat is the emergence and spread of “superbugs” called multi-drug resistant organisms (MDROs). MDROs are resistant to multiple types of antibiotics, difficult to treat when they cause infection and are responsible for thousands of deaths annually.

By learning more about the microbiome, researchers can progress the ongoing battle against superbugs.

With this battle in mind, in 2014, Nasia Safdar, MD, PhD and Ajay Sethi, PhD, MHS, pitched the idea for the “Wisconsin Microbiome Study” (Winning the War on Antibiotic Resistance in Wisconsin project—or “WARRIOR” for short) to study the presence of MDROs in Wisconsin’s residents. Their study sought to assess the relations between dietary intake of fiber, the organisms comprising the gut microbiome and the presence of MDROs in the digestive tract. This project wrapped up in 2017.

SHOW researchers will return to the homes of previous participants hoping to get another look at the gut microbiome to see if there are any changes to its composition and to see if that correlates with various exposures.

To do this, researchers will carry out “The Wisconsin Microbiome Follow-Up Study.” Researchers plan to collect another stool specimen and samples from the home where microbes reside. These include swabs of frequently touched surfaces in the home, dust in the carpet, water from the tap and soil outside the home. These new elements will help researchers to understand the relations between the home environment, the gut microbiome and human health. This is a new and exciting frontier for microbiome researchers.

SHOW will bank all data and specimens collected in this follow-up study. The follow-up will provide opportunities for other researchers and students at the university to work with the SHOW to answer their and an endless number of important future microbiome-related questions.
How does my data drive insights?

When answering questions and donating samples, SHOW participants provide data on a wide-range of health topics. In turn, researchers can use SHOW data to answer questions that advance the health of Wisconsin residents in more than just one area of study.

A recent application of SHOW data revealed connections between allergic diseases and the environment. Growing evidence demonstrates that air pollution is a risk factor for diseases like asthma and allergies. In fact, research among young children suggests that outdoor pollution contributes to the presence of these allergic diseases. However, there is little consistent research about adult populations and the long-term risk that air pollution poses to them.

Pollution and Wisconsin Health

To study these chronic effects, researchers used data from SHOW participants during the timeframe of 2008 to 2013. Information from over 3,000 Wisconsin residents was used to trace the effects of pollution.

Researchers examined SHOW participants with chronic exposure to traffic and industrial-related air pollution, as well as exposure to fine particulate matter — an air pollutant that is a known health hazard. The study discovered that traffic-related pollution and chronic exposure to fine particulate matter was associated with the presence of allergies and asthma. Researchers found that living within 300 meters of an Interstate roadway was associated with a three-fold increase in the odds of asthma. Residents who lived within 800 meters of an industrial site were 47 percent more likely to have asthma.

By using SHOW participant data, the study revealed important connections between pollution and statewide health. This valuable information can be used to influence air pollution standards in order to reduce the damaging effects on Wisconsin residents’ health.

Building a healthy community for all Wisconsin residents

By Tarakee Jackson

Meet SHOW’s Milwaukee Community Engagement Specialist, Tarakee Jackson. We asked Tara to share her insights on the importance of SHOW’s data collection efforts among Milwaukee’s African American and Latino communities in the coming year.

As a child, I remember my mother using old Southern remedies to treat colds and other common illnesses. Remedies such as heated “sweet oil” in my ear or Vicks vapor rub on my feet with two pairs of socks. Today, many doctors would disagree with this treatment and instead prescribe medication. However, these remedies and similar treatments have been a part of culture and tradition for generations.

Illnesses such as diabetes, cancer, Alzheimer’s disease and lupus cannot be treated with such simple remedies. These illnesses are a growing concern for people within African American and Latino communities, yet most reports do not reflect our communities’ needs.

In the past, a “healthy community” referred to economic wealth rather than the well-being of people. However, a true healthy community must include personal health in mind, body and spirit. In order to receive the proper support needed to build healthier communities for African Americans and Latinos, we must make sure all voices are heard.

One of my favorite quotes is from U.S. Representative Maxine Waters: “Everyone has a part to play. We have the power and we can do it.” We have the power to bring change to communities. Change must come with awareness, education, support and -- most importantly -- diversity.

For several years, the majority was the standard to gather data and information regarding medical care. However, the majority does not accurately represent all people. Due to lack of representation in reporting, communities are often left out of the programs that are designed to financially support treatments. As a member of the SHOW team, I am working to bring education, access, awareness and representation to all communities.

In 2018, the SHOW program will focus on gathering information about health topics that are important to African American and Latino communities. This information can be used to provide data to city and state politicians or decision-makers.

If we, as a people, do not actively speak out about our concerns and lack of resources, we will never achieve a healthy community. It is essential for the next generation that we earnestly seek out help to promote positive health factors within every community.

School of Medicine and Public Health
University of Wisconsin–Madison