



**TEXAS**  
The University of Texas at Austin



# WHOLE COMMUNITIES— WHOLE HEALTH

ANNUAL REPORT 2021





---

# Grand Challenges Are Moonshot Goals

To reach those goals and address the most urgent issues affecting our society, researchers from different disciplines must share knowledge, ask questions, and tear down academic barriers.






# TABLE OF CONTENTS

---

4	Bridging Barriers
6	A Complete Picture of Health
8	From the Chairs
10	Milestones
12	Whole Communities–Whole Health Highlights
14	Our Network
16	Understanding Whole Health
24	Designing and Refining Our Technology
28	Taking Our Work Into the Community
34	Research and Scholarly Output
38	Grants and Awards
40	Our Community Partners
41	Participating Schools, Departments, and Units
42	Whole Communities–Whole Health Leadership



Detail of a bench  
inside the Seay  
Building, which  
houses the  
Department of  
Psychology and UT's  
Priscilla Pond Flawn  
Child and Family  
Laboratory.



# BRIDGING BARRIERS

---

We are bridging barriers between fundamental knowledge and real-world problems by connecting disciplines, techniques, and ways of thinking.

In 2016, The University of Texas at Austin introduced an initiative with one overarching mission: break down academic silos and foster research that addresses the toughest questions facing humanity and the world.

Bridging Barriers serves as an incubator for some of the boldest interdisciplinary projects at UT by supporting researchers from across the Forty Acres as they form broad teams tasked with identifying urgent, real-world issues — and figuring out the best way to solve them in less than a decade.

These projects are rooted in collaboration and academic freedom to produce practical solutions to social, environmental, and humanitarian crises. From artificial intelligence to climate change to health inequity, teams around campus are working on solutions to some of the greatest problems of our generation.

To learn more about Whole Communities–Whole Health and all of UT's research grand challenges, visit the [Bridging Barriers website](#).

# A COMPLETE PICTURE OF HEALTH

---

Recent advances in science give us the unprecedented ability to understand health and human behavior — including physical activity, emotions, environmental exposures, and social interaction — and to use that knowledge to extend our quality and length of life. But when it comes to life expectancy, ZIP code continues to matter more than genetic code.


At the same time, advances in technology also means we can collect and analyze data in new ways from connected devices. Unfortunately, though, science and technology aren't serving everyone equally. Communities with access to fewer resources face unacceptable health disparities.

Whole Communities–Whole Health is a UT research grand challenge that seeks to understand more about the factors that affect the health of families facing systemic injustice. A key part of that research involves a 5-year cohort study that looks at the health of families in marginalized communities. In advance of the study, our research teams collected data about

social determinants of health while listening to people living and working in our study area in eastern Travis County — asking what matters most to them when it comes to building a more socially just, equitable, and healthy future for their families. While researchers have a wealth of knowledge in their specific fields, families facing challenges are experts in their own experiences. In conversations with these families, we have heard a deep desire to secure a happy, healthy future for their children and frustration with problems outside of their control, like air and water pollution where they live and poor access to grocery stores, greenspace, and healthcare.

These insights and expertise have informed our community cohort study, which kicked off in 2021. The goal of our grand challenge is not only to uncover the myriad, interconnecting factors that affect health in vulnerable communities but also to give what we learn back to them as quickly as possible so that they, along with our local partner organizations, can make changes that lead to better health — starting now.



A photograph of a man and a young girl in a kitchen. The man, wearing a light-colored long-sleeved shirt, is standing behind the girl, who is wearing a pink sleeveless top. They are both focused on washing their hands at a kitchen sink. The girl is holding a bar of green soap. Water is running from a modern faucet into the sink. In the background, there are white kitchen cabinets and a dish rack with white dishes.

Read on to see how we're  
defining whole health,  
designing, and refining our  
technology, and taking our  
work into the community.

# FROM THE CHAIRS

---

Several factors come together to influence children's health, from nutrition and air quality to family stress. The process of addressing each factor can take years of investigation when conducted by a single laboratory or small group of researchers. From its inception, the Whole Communities–Whole Health grand challenge team has sought to change that by bringing together experts from different disciplines and community groups to get a comprehensive look at the complex issues that affect health.

Our cohort study, which launched in 2021, will follow 300 families over the course of five years, focusing on communities that have traditionally been excluded from participatory scientific research, such as low-income and marginalized families, who, because of persistent, systemic inequity, may lack adequate resources and services that help children thrive.

For the last three years, we have been working with local groups, schools, organizations, and trusted community leaders in southeast Travis County to design a study that would address their unique concerns and give them the information they wanted to know about their health, and we have recruited our first study participants, who we call our “ambassador families.” They will take part in the initial stage of our study — completing surveys, offering biological samples, installing our

environmental sensing devices — and their input will help us refine our methods before we scale up with even more participants next year.

As this report is being compiled, we are putting the finishing touches on our mobile app called “Hornsense,” which our participants will be able to download to their phones to view the findings from our study, including factors like their home air quality and how it compares to others in their community, so that they and policy advocates can use it to make critical changes.

Assembling an interdisciplinary team of diverse faculty and community members has been a career-altering journey for many of us. Collectively, we continue to make connections with community partners who can use our study data to advocate for change within the systems that created these health disparities. Yet, it is one new mother who said it best: “I [grew] up with mistrust. My mother did not trust doctors, UT, or science. I want to learn more. I want my family to be different. I want my children to be able to trust.”

And we want to be different, too. We, as scientists and scholars, endeavor to do better and earn their trust. We are grateful for the opportunity and for those with whom we have shared our experience to date, and we are thrilled for you to learn about our successes over the past year as well as our future plans. Stay tuned for exciting things ahead!





**DARLA CASTELLI**

**Professor**

Department of Kinesiology  
and Health Education

**WHOLE COMMUNITIES–WHOLE HEALTH  
CO-CHAIR, 2021**



**KERRY KINNEY**

**Professor**

Department of Civil, Architectural and  
Environmental Engineering

**WHOLE COMMUNITIES–WHOLE HEALTH  
CO-CHAIR, 2021**





# MILESTONES

DECEMBER 2020

---

Whole Communities–Whole Health holds its Research Showcase, highlighting the work the grand challenge team has conducted in its first two years, including investigating home air quality, the experience of racism on adolescent stress, and what our daily digital footprint can tell us about mood and stress levels.

JANUARY 2021

---

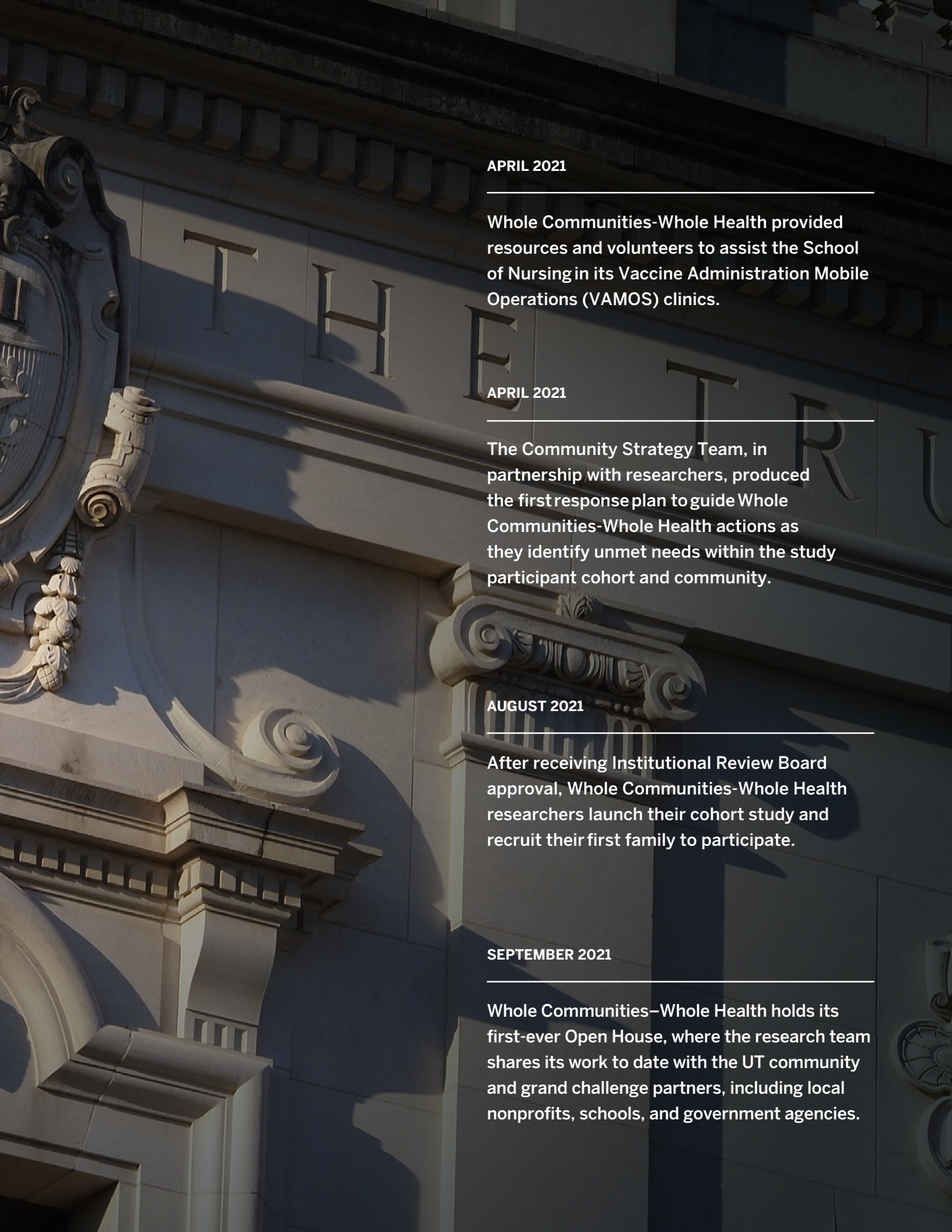
After years of effort building relationships with community organizations and families, the Whole Communities–Whole Health research team engaged its 300th family in eastern Travis County.

MARCH 2021

---

Civil, Architectural and Environmental Engineering Assistant Professor Pawel Misztal and his research laboratory colleagues take their “sniffer” instrument on the road to detect air quality in real time on the streets of Del Valle, where residents had reported odors.





APRIL 2021

---

Whole Communities-Whole Health provided resources and volunteers to assist the School of Nursing in its Vaccine Administration Mobile Operations (VAMOS) clinics.

APRIL 2021

---

The Community Strategy Team, in partnership with researchers, produced the first response plan to guide Whole Communities-Whole Health actions as they identify unmet needs within the study participant cohort and community.

AUGUST 2021

---

After receiving Institutional Review Board approval, Whole Communities-Whole Health researchers launch their cohort study and recruit their first family to participate.

SEPTEMBER 2021

---

Whole Communities-Whole Health holds its first-ever Open House, where the research team shares its work to date with the UT community and grand challenge partners, including local nonprofits, schools, and government agencies.



**FY21**

# WHOLE COMMUNITIES— WHOLE HEALTH HIGHLIGHTS

IN NUMBERS

## SCHOLARLY OUTPUT & PUBLICITY



**14** news articles,  
blog posts and  
university stories

**66**  
scholarly  
works

## EXPANDING NETWORKS

**23**

University  
of Texas  
departments  
and units

**28**

hosted  
events

**94**

Good Systems  
active researchers

# BUILDING CAPACITY

**\$6.6M** <sup>TO DATE</sup> Awarded in external funding



Contributed its expertise to

more than **\$2.8M** <sup>TO DATE</sup>

in externally funded projects and centers across UT and the State of Texas



**\$238K**

in grants awarded to our community partners

## ENGAGING STUDENTS

**35** undergraduate & graduate student researchers



**32**  
external partners

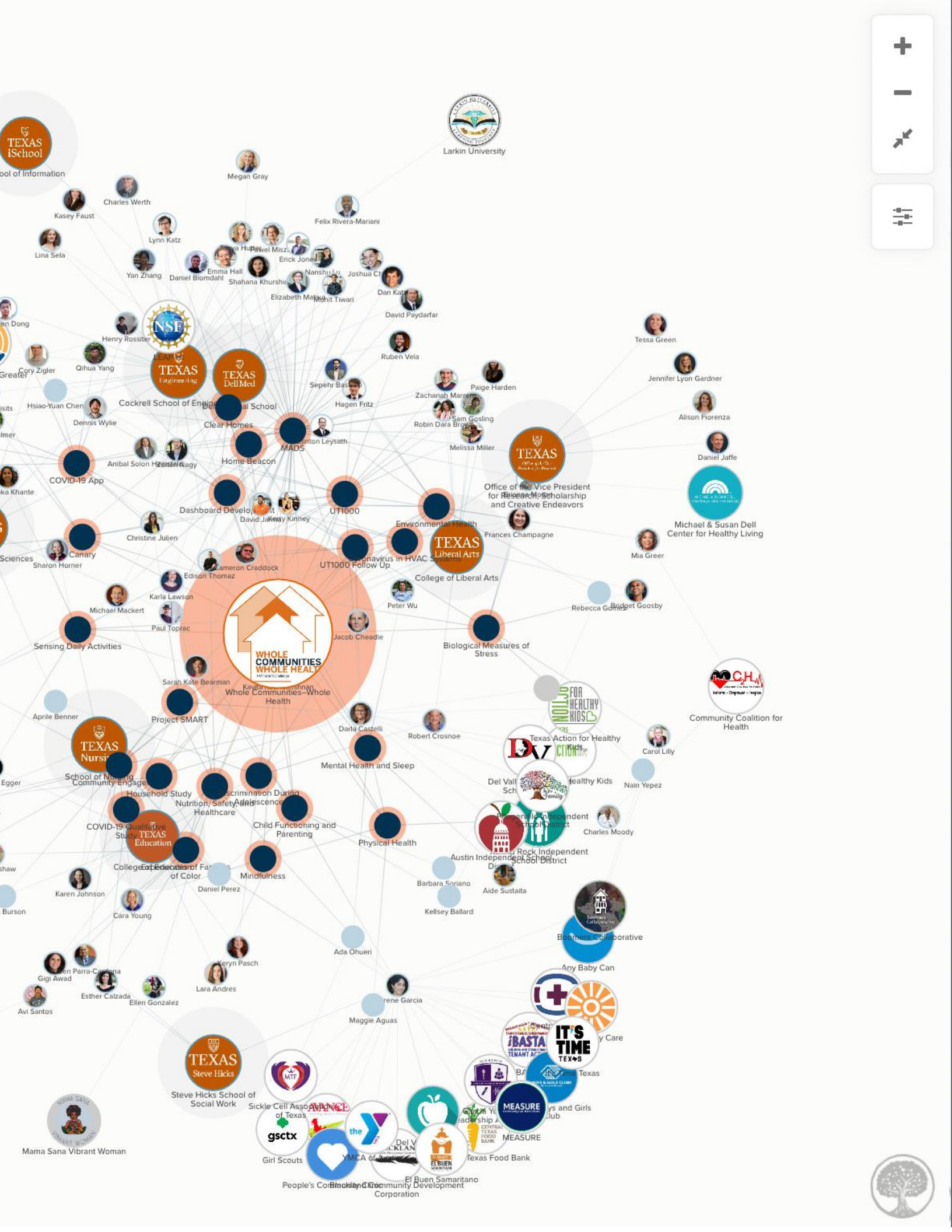


## OUR NETWORK

The Whole Communities–Whole Health Grand Challenge team includes researchers from more than two dozen disciplines, such as psychology, nursing, communications, and engineering, as well as community groups like the Central Texas Food Bank and Any Baby Can.

Explore our network map or browse [the team list](#) on the Whole Communities–Whole Health website to see how our connections are contributing to our overall mission of putting science in service to society.





# UNDERSTANDING WHOLE HEALTH

---

Children enter the world with tremendous potential, but early adversity can lead to lifelong challenges. Stressors like poverty, family separation, exposure to toxins and pollution, or discrimination can take a serious toll on their biological systems, increasing the chance of physical and mental health problems as well as school difficulties, unemployment, and even a shorter life expectancy. However, despite this adversity, some children will still thrive. What elements shield these children from the worst outcomes? Is it supportive relationships? Access to health clinics? Clean air and a healthy environment?

To find out, we have designed a study where we follow 300 families with children over a 5-year period, collecting data to find out what factors affect their health. Our study differs from others in that it includes, as part of the design and planning, people traditionally excluded from this type of research.

We sat down with community members over the last year to find out their biggest health concerns to determine what we should study. They told us they worried about pollution, stress, food insecurity, and the quality of their schools, among other factors. With that knowledge, in the summer of 2021, we decided on a key set of study measures that will inform our work over the next five years.

We will be collecting data from both children and their parents because biological factors, along with the family system, influence child wellbeing. With sensors, wearable bands, and environmental home beacons that measure air quality, we can collect minute-by-minute health information about a variety of factors, rather than only periodic snapshots from families' lives.

Read ahead to learn more about our cohort study and community health.







Sheri Burson, a doctoral student in the Department of Kinesiology and Health Education, puts together physical activity kits that will be delivered to Whole Communities—Whole Health families. The children will wear activity bands to measure how active they are.

PHOTO CREDIT: CALLIE RICHMOND

### Here are some of the different measures we will be examining:

- Parenting style
- Stress
- Social support
- Mental health
- Child temperament
- Indoor and outdoor air pollution
- Exposure to toxins
- Drinking water quality
- School quality
- Academic achievement
- Neighborhood walkability
- Acculturation
- Racial socialization
- Biology
- Sleep quality
- Physical activity
- Health literacy
- Food insecurity
- Nutrition






Whole Communities–Whole Health study coordinator Sarah Smith hands a sample collection kit to one of the cohort study participants to gather biological specimens and dust inside the home.


PHOTO CREDIT: CALLIE RICHMOND



Whole Communities–Whole Health is conducting a 5-year cohort study to examine the complex, interconnected factors that affect the health and wellbeing of families in marginalized communities. But what exactly is a cohort study? Psychology Professor David Schnyer explains and shares how ours differs from most traditional health studies of this type. [Read more.](#) 





In listening to community members in southeast Travis County, the Whole Communities–Whole Health team heard about several concerns in their neighborhoods, including odors. With a new, state-of-the-art device called the Vocus 2R PTR-TOF-MS, Civil, Architectural and Environmental Engineering Assistant Professor Pawel Misztal and a team of researchers set out to learn more about chemical compounds in the air, what could be contributing to the smell, and if it's dangerous. [Learn more about their work and why air quality is important to overall health.](#) 

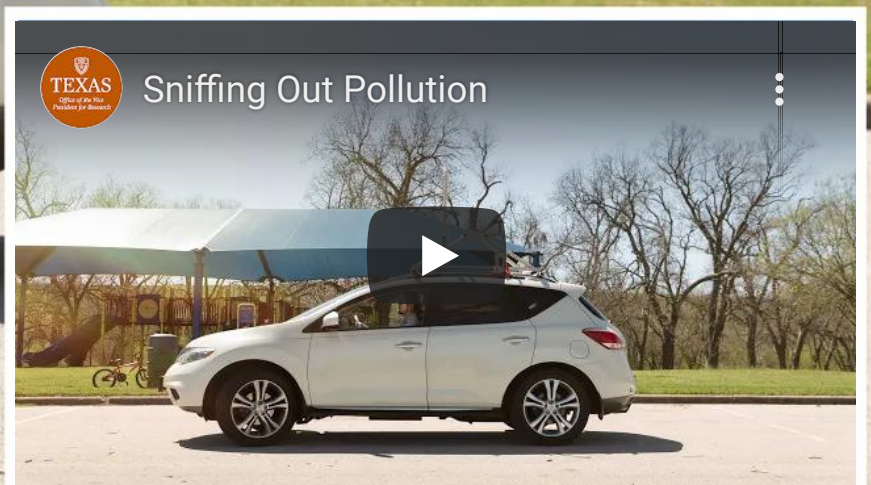




---

UT Austin Civil, Architectural and Environmental Engineering Assistant Professor Pawel Misztal drives the Vocus "Sniffer" through a park in eastern Travis County.

PHOTO CREDIT: AMY BEST











It's sometimes obvious how things like air quality and access to healthcare can affect health. Yet, there are other variables we often don't think about when conducting health studies that can affect people's wellbeing in the long-term, including discrimination and racism, which create a measurable and physical stress response that can lead to wear and tear on the body. Sociology Professor Bridget Goosby and Human Development

and Family Studies Associate Professor Aprile Benner have been studying this as part of Whole Communities–Whole Health, tracking the health of 145 Black and Latina/o adolescents to learn how discrimination affects sleep, nutrition, and stress response — factors that can result in chronic disease.

[Learn more about this work.](#) 



# DESIGNING AND REFINING OUR TECHNOLOGY

---

Today, we have the unprecedented technological ability to study health and human behavior in ways we never thought possible. Wearable devices can tell us things like heart rate, physical activity, temperature, and location while smart home gadgets can give us a glimpse into the environmental atmosphere of our houses. While commonplace, this kind of technology — surprisingly — isn't used enough in health research. We plan to change that.

We are designing new technology that will not only improve the way we collect data but also how we share it with our participants. And central to our study is a mobile application that we have designed for Apple and Android devices. It will allow us to send periodic surveys to participant families while the app's sensors tell us important details like travel behavior and physical activity.

In addition to collecting data, the app also helps participants submit reports about things they find concerning in their communities, such as poor water quality or bad smells in the air. This concept aligns with our vision of community-engaged research, where participants have a say in what we study.

Most important, the app provides a dashboard through which participants can view the data they have contributed to the study and compare it with anonymized, aggregated information about their community. By being able to view their own data, participants will be able to make personal changes to improve their health. And if they aren't sure how to make those improvements, the app in the future will direct them to resources that can help, like rent and food assistance. And aggregate data will provide a window into community-wide health issues so that community organizations and policymakers can use it to make important systemic changes.

Read ahead to learn more about our technology and how we're putting it to work for our participants.



Electrical and Computer Engineering Professor Christine Julien works to create a mobile application that will share Whole Communities–Whole Health study data with participants.

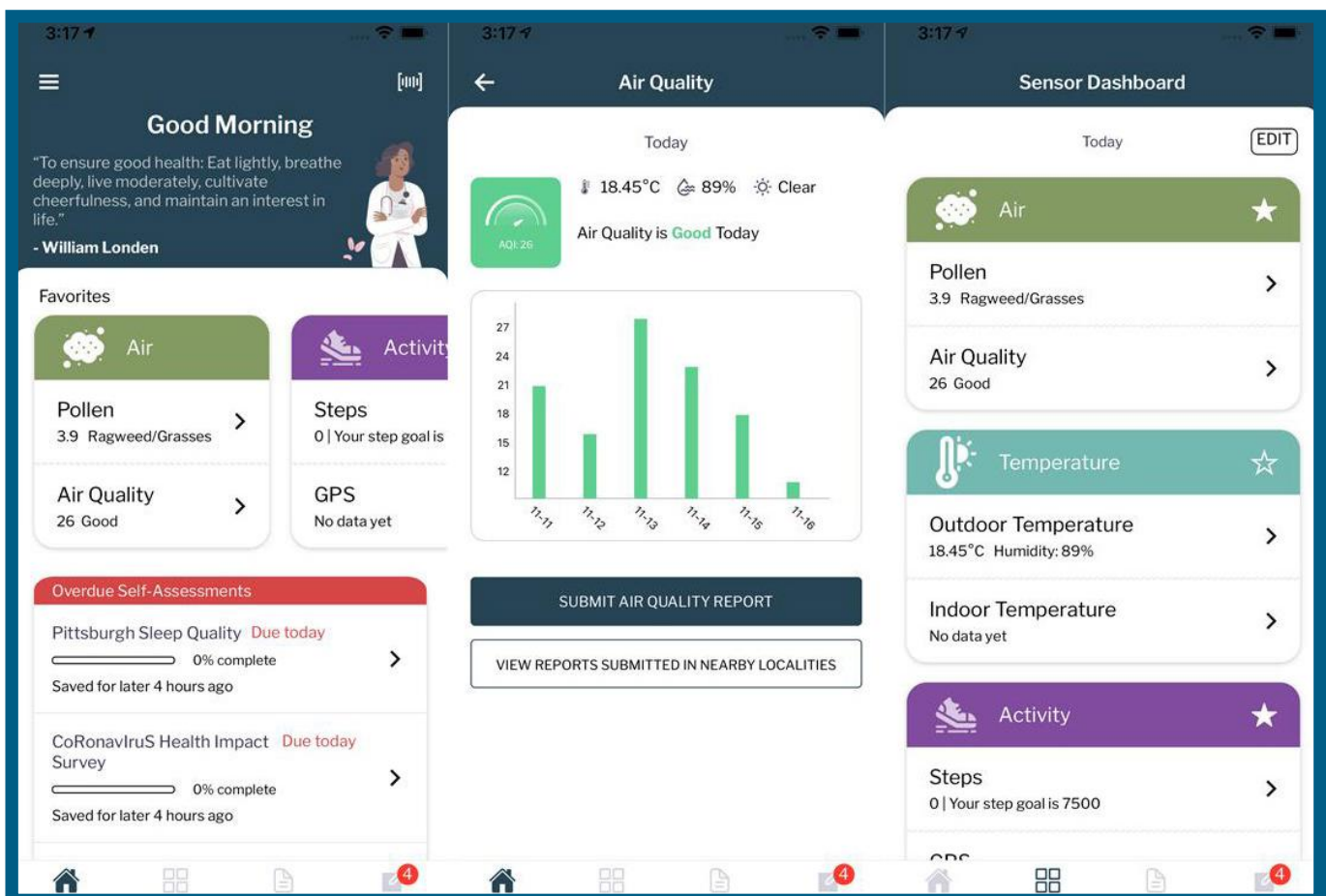
PHOTO CREDIT: CALLIE RICHMOND






As part of the Whole Communities–Whole Health cohort study, we’ve promised to give our findings back to the people who need it most — our participants. To do that, we’ve designed a mobile app that they’ll be able to install on their phones to access data like the air quality in their homes and neighborhoods and how well they’ve slept. The app, called Hornsense, is currently in beta testing and will be available on Android and Apple devices. It is the primary portal through which our participants can access the results of our study, allowing them to advocate for important changes that will affect the health of their families and communities. [Learn more about the app and what it can do.](#)

The Hornsense mobile app shows cohort study participants different variables, such as the air quality and allergens in their homes and their level of physical activity.





We at Whole Communities–Whole Health understand the privacy implications when collecting personal data about families and children, especially when we are making that data available to them and to community groups through a mobile app. That's why we are doing everything we can to ensure the platform is safe and personal information is secure, such as by encrypting data and storing the most sensitive information on our participants' own devices. Data privacy is key to maintaining trust and ensuring that families feel comfortable collaborating with us. Electrical and Computer Engineering Professor Christine Julien describes what Whole Communities–Whole Health is doing to protect participants' data. [Read more.](#) 



---

The Whole Communities–Whole Health team decided to create a mobile app in house, relying on a team of researchers and students to design the unique interface made especially for participants rather than trying to retrofit existing technology to meet their specifications.

PHOTO CREDIT: CALLIE RICHMOND



# TAKING OUR WORK INTO THE COMMUNITY

---

In August 2021, we launched our cohort study by enrolling 15 ambassador families, who we got to know from our work in an eastern Travis County community. They each have children up to 9 years old and will be the first to participate in surveys, provide biological samples, and use our technology to collect information about their health. Through their participation, we will be able to gauge whether the methods we are using are truly non-intrusive, as is our intent, and that our study measures provide valuable insights that link actions, attitudes, and environmental factors to health. As we receive feedback from the ambassador families, we plan to review and revise our study as needed before we reach our full study enrollment of 300 families by the end of 2022.

This past year, as we anticipated the launch of our study, we remained busy working with community members as they faced innumerable challenges related to the pandemic. We sent physical activity kits to families confined to their homes to help kids stay active. Nursing faculty on our research team also helped administer vaccines on the UT campus when they became available. And Whole Communities–Whole



Health helped sponsor a new program called Vaccine Administration Mobile Operations, or VAMOS, a vaccination campaign to get shots to underserved communities that don't have adequate transportation or means to take off work for medical appointments. It's been an honor to serve our community in this way.

Our next major task will be figuring out how to translate the data from our study into actionable changes for families. Our Community Strategy Team, which includes local advocates from Austin Public Health, the Del Valle School District, the Community Coalition for Health, and others who work alongside us, has designed a response plan that will guide how our researchers respond to





Whole Communities–Whole Health has spent the past two years building relationships in the Del Valle community and actively recruiting our initial ambassador families. We made connections with families in several ways: placing flyers at local wellness centers; posting information on community Facebook pages; and joining neighborhood and school district events. We also recruited people through mobile vaccine clinics during the pandemic. To date, we have 15 families who have signed on to participate and more to come.

PHOTO CREDIT: CALLIE RICHMOND

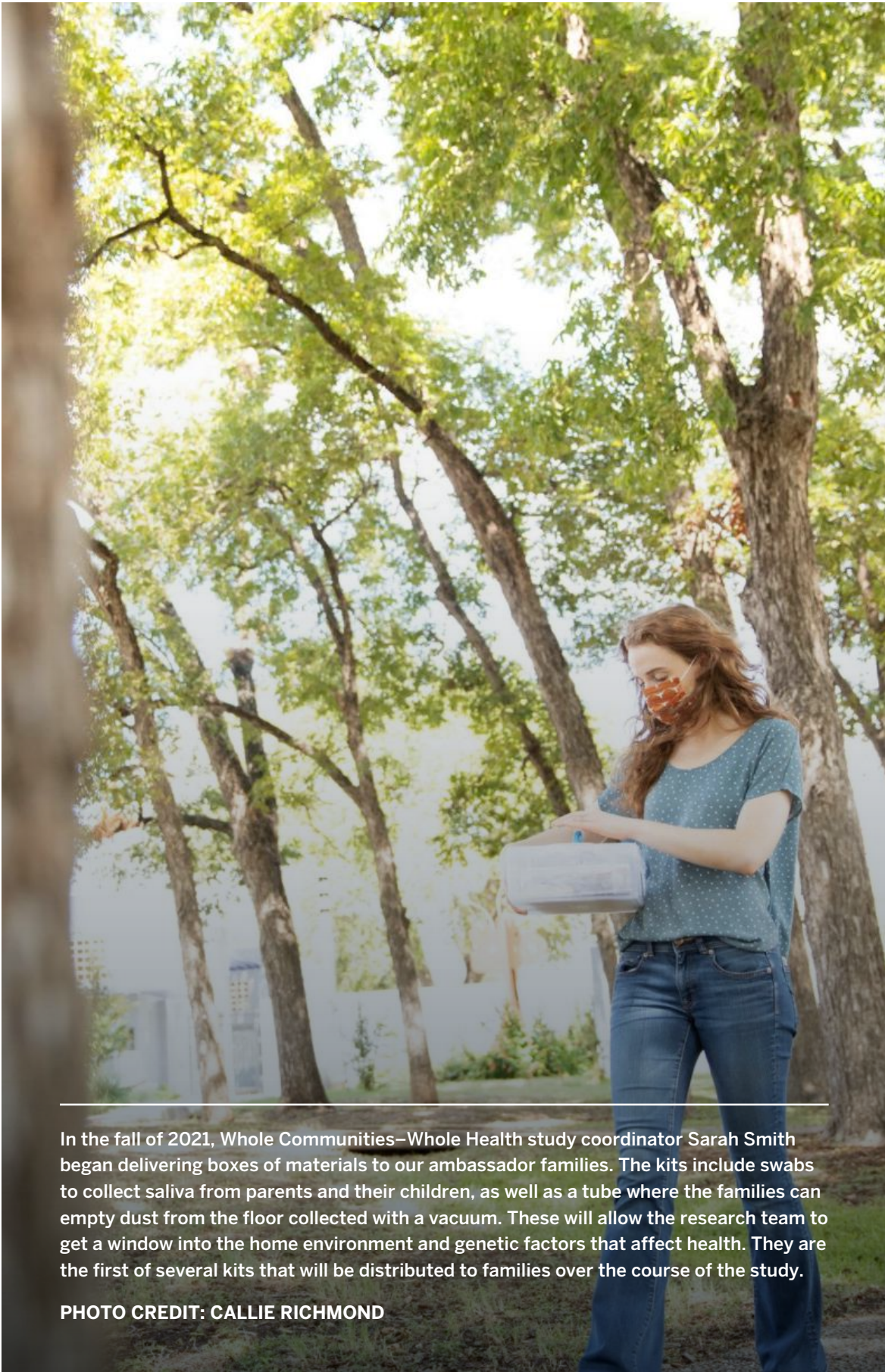
health concerns as they become known. For example, if our team discovers that a family is living in a “healthcare desert” — an area with inadequate access to medical facilities — we can help them find the nearest health clinic and arrange transportation to get there. On a community level, we might respond to an issue like mold in an apartment complex or widespread food insecurity by calling together stakeholders from local nonprofits, corporations, and government agencies — getting the right people in the room — to come up with the best solution that serves the greatest number of people.

Read ahead to learn more about our work in the community and our ambassador families.

“I wanted to be a part of this study in hopes that it would shine a light on the hardships the residents of Del Valle face. I’m also interested in knowing more about our quality of life and how my children are impacted.”

— WHOLE COMMUNITIES–WHOLE HEALTH AMBASSADOR FAMILY PARENT





In the fall of 2021, Whole Communities–Whole Health study coordinator Sarah Smith began delivering boxes of materials to our ambassador families. The kits include swabs to collect saliva from parents and their children, as well as a tube where the families can empty dust from the floor collected with a vacuum. These will allow the research team to get a window into the home environment and genetic factors that affect health. They are the first of several kits that will be distributed to families over the course of the study.

**PHOTO CREDIT: CALLIE RICHMOND**




Participant data will remain completely anonymous throughout the course of the study. Biological samples are marked only with an ID number, rather than a name. Keeping information anonymous during analyses or interpretations is best practice, as it may cause confirmation bias or other forms of bias to influence the results. It is also crucial to protecting participant confidentiality. Our primary responsibility is to ensure our Whole Communities–Whole Health families feel comfortable working with us and confident that the information they provide is protected. Their trust is key to our success as a grand challenge.

**PHOTO CREDIT: CALLIE RICHMOND**







In December 2020, The University of Texas at Austin received its first doses of the COVID-19 vaccine that nursing, social work, pharmacy, and medical school faculty and staff began administering on campus at Gregory Gym. Nursing Associate Professor and Whole Communities–Whole Health researcher Karen Johnson was among the first to volunteer to give shots. [Read her story.](#) 

---

Karen Johnson,  
a public health nurse and an  
associate professor in the  
School of Nursing.

PHOTO CREDIT: JANET EHLE



Whole Communities–Whole Health researchers took wastewater samples from South Austin Regional Wastewater Treatment.

PHOTO COURTESY OF AUSTIN WATER

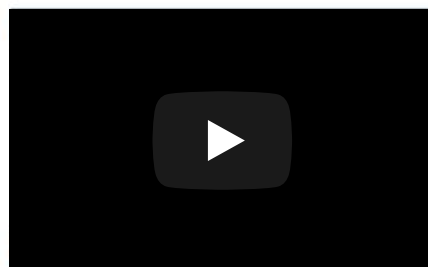


Whole Communities–Whole Health researchers are part of a team that has been testing Austin's wastewater for signals of COVID-19 to track virus cases in the city. They took samples from wastewater treatments plants in August 2021 and discovered through testing that the delta and epsilon variants were the most common in the city at that time. With renewed funding, samples taken in December 2021 can be sequenced to determine common variants.

[Read more about this important work.](#) 

## Event Spotlight

In 2021, we kicked off our Whole Communities–Whole Health Interdisciplinary Seminar Series, where faculty experts can share about their work as part of the grand challenge and other health-related topics. [View the presentations we've hosted so far.](#)







# RESEARCH AND SCHOLARLY OUTPUT

---

In fiscal year 2021, Whole Communities–Whole Health researchers produced more than 60 scholarly works, including peer-reviewed articles, preprints, conference proceedings, and presentations.

**Dynamic Epigenetic Impact of the Environment on the Developing Brain** | Frances Champagne | In *The Cambridge Handbook of Infant Development: Brain, Behavior, and Cultural Context*, edited by Jeffrey A. Lockman and Catherine Tamis-LeMonda. Cambridge University Press, 2020

[View](#)

**Race and Ethnic Variation in College Students' Allostatic Regulation of Racism-Related Stress** | Jacob E. Cheadle, Bridget J. Goosby, Joseph C. Jochman, Cara C. Tomaso, Chelsea B. Kozikowski Yancey, and Timothy D. Nelson | *Proceedings of the National Academy of Sciences* 117, no. 49 (December 8, 2020): 31053–62

[View](#)

**Consider How Social Distancing Policies Can Affect Drinking Water Infrastructure Performance** | Kasey M. Faust, Lynn E. Katz, Mary Jo Kirisits, Kerry A. Kinney, Lina Sela, Marina Kopytkovskiy, Caroline Russell, and Jessica Kaminsky | *Journal AWWA* 113, no. 2 (March 2021): 74–77

[View](#)

**Do Trait Psychological Characteristics Moderate Sympathetic Arousal to Racial Discrimination Exposure in a Natural Setting?** | Elizabeth B. Jelsma, Bridget J. Goosby, and Jacob E. Cheadle | *Psychophysiology* 58, no. 4 (2021): e13763

[View](#)

**Development of a School-Based Physical Activity Intervention Using an Integrated Approach: Project SMART** | Yeonhak Jung, Sheri L. Burson, Christine Julien, Dylan F. Bray, and Darla M. Castelli | *Frontiers in Psychology* 12 (2021): 3408

[View](#)

**Sensing Everyday Activity: Parent Perceptions and Feasibility** | Hannah I. Levin, Dominique Egger, Lara Andres, Mckensey Johnson, Sarah Kate Bearman, and Kaya de Barbaro | *Infant Behavior and Development* 62 (February 2021): 101511  
[View](#)

**Chapter 7: Selective Integration: Roles for Public Health, Kinesiology, and Physical Education** | Darla M. Castelli and Latrice Sales Mitchell | *Journal of Teaching in Physical Education* 40, no. 3 (June 11, 2021): 402–11  
[View](#)

**Project SMART: A Cooperative Educational Game to Increase Physical Activity in Elementary Schools** | Christine Julien, Darla Castelli, Dylan Bray, Sangsu Lee, Sheri Burson, and Yeonhak Jung | *Smart Health* 19 (March 2021): 100163  
[View](#)

**Mobile Apps as Audience-Centered Health Communication Platforms** | Michael Mackert, Dorothy Mandell, Erin Donovan, Lorraine Walker, Mike Henson-García, and Lindsay Bouchacourt | *JMIR MHealth and UHealth* 9, no. 8 (August 17, 2021): e25425  
[View](#)

**Distribution of SARS-CoV-2 RNA Signal in a Home with COVID-19 Positive Occupants** | Juan P. Maestre, David Jarma, Jia-Rong F. Yu, Jeffrey A. Siegel, Sharon D. Horner, and Kerry A. Kinney | *Science of the Total Environment* 778 (July 2021): 146201  
[View](#)

**Rest-Activity Rhythms and White Matter Microstructure Across the Lifespan** | Megan McMahon, Yoshita Malneedi, Darrell A. Worthy, and David M. Schnyer | *Sleep* 44, no. 6 (June 1, 2021)  
[View](#)

**Implications of Social Distancing Policies on Drinking Water Infrastructure: An Overview of the Challenges to and Responses of U.S. Utilities during the COVID-19 Pandemic** | Lauryn A. Spearing, Nathalie Thelemaque, Jessica A. Kaminsky, Lynn E. Katz, Kerry A. Kinney, Mary Jo Kirisits, Lina Sela, and Kasey M. Faust | *ACS ES&T Water* 1, no. 4 (April 9, 2021): 888–99  
[View](#)

**Improving Prediction of Real-Time Loneliness and Companionship Type Using Geosocial Features of Personal Smartphone Data** | Congyu Wu, Amanda N. Barczyk, R. Cameron Craddock, Gabriella M. Harari, Edison Thomaz, Jason D. Shumake, Christopher G. Beevers, Samuel D. Gosling, and David M. Schnyer | *Smart Health* 20 (April 2021): 100180  
[View](#)

**Multi-Modal Data Collection for Measuring Health, Behavior, and Living Environment of Large-Scale Participant Cohorts** | Congyu Wu, Hagen Fritz, Sepehr Bastami, Juan P Maestre, Edison Thomaz, Christine Julien, Darla M Castelli, Kaya de Barbaro, Sarah Kate Bearman, Gabriella M. Harari, R. Cameron Craddock, Kerry A. Kinney, Samuel D. Gosling, David M. Schnyer, and Zoltan Nagy | *GigaScience* 10, no. 6 (June 21, 2021): giab044  
[View](#)

**Connections Between Relational Event Model and Inverse Reinforcement Learning for Characterizing Group Interaction Sequences** | Congyu Wu | *ArXiv:2010.09810* [Cs], October 19, 2020  
[View](#)

**Improving Prediction of Real-Time Loneliness and Companionship Type Using Geosocial Features of Personal Smartphone Data** | Congyu Wu, Amanda N. Barczyk, R. Cameron Craddock, Gabriella M. Harari, Edison Thomaz, Jason D. Shumake, Christopher G. Beevers, Samuel D. Gosling, and David M. Schnyer | *ArXiv:2010.09807* [Cs], October 19, 2020  
[View](#)

**Multi-Modal Data Collection for Measuring Health, Behavior, and Living Environment of Large-Scale Participant Cohorts: Conceptual Framework and Findings from Deployments** | Congyu Wu, Hagen Fritz, Zoltan Nagy, Juan P. Maestre, Edison Thomaz, Christine Julien, Darla M. Castelli, Kaya de Barbaro, Gabriella M. Harari, R. Cameron Craddock, Kerry A. Kinney, Samuel D. Gosling, and David M. Schnyer | *ArXiv:2010.08457* [Cs], October 16, 2020  
[View](#)

**Distribution of SARS-CoV-2 RNA Signal in a Home with COVID-19 Positive Occupants** | Juan P. Maestre, David Jarma, Cesca Yu, Jeff Siegel, Sharon Horner, and Kerry A. Kinney | *MedRxiv*, December 2, 2020

**Exploring Post COVID-19 Outbreak Intradaily Mobility Pattern Change in College Students: A GPS-Focused Smartphone Sensing Study** | Congyu Wu, Hagen Fritz, Cameron Craddock, Kerry Kinney, Darla Castelli, and David M. Schnyer | *ArXiv:2107.04137* [Cs], July 8, 2021  
[View](#)

**Circadian Rhythms Are Not Captured Equal: Exploring Circadian Metrics Extracted by Different Computational Methods from Smartphone Accelerometer and GPS Sensors in Daily Life Tracking** | Congyu Wu, Megan McMahon, Hagen Fritz, and David M. Schnyer | *ArXiv:2107.04135* [Cs], July 8, 2021  
[View](#)

**Full House: Microbial and Nonmicrobial Volatile Organic Compounds Competing for 'Residency' in Indoor Environments at Cycling Relative Humidity** | Emma Hall, Sarah Haines, Karen Dannemiller, Katarzyna Marciniak, Robin Weber, Allen Goldstein, Rachel Adams, and Pawel Misztal | Conference paper presented at Indoor Air 2020, Seoul, South Korea, 2020

**Project SMART: A Cooperative Educational Game to Increase Physical Activity in Elementary Schools** | Christine Julien, Darla Castelli, Dylan Bray, Sangsu Lee, Sheri Burson, and Yeonhak Jung | Conference paper at CHASE 2020: IEEE/ACM international conference on Connected Health: Applications, Systems and Engineering Technologies, December 2020



**Shining the Light on Potential Inequities: Emerging Findings from Three Studies on COVID-19** | Sarah Kate Bearman, Kevin Cokley, and Marc Eddy | Panel Discussion presented at the UT COVID-19 Conference, Austin, TX, November 2020

**Chemical Exposure to Disinfection Byproducts Interacting on Personal Face Masks** | Daniel Blomdahl | Oral presentation presented at the RIG Sensors Seminar Series, Austin, TX, October 9, 2020

**The Protect Texas Together App** | Cameron Craddock | Oral presentation presented at the UT COVID-19 Conference, Austin, TX, November 2020

**Implications of Social Distancing Policies on Water Infrastructure Systems** | Kasey Faust | Oral presentation presented at the UT COVID-19 Conference, Austin, TX, November 2020

**Health Communication to Support the University of Texas at Austin Response to COVID-19** | Jessica Hughes Wagner, Deena Kemp, Michael Mackert, and Kate Pounders | Panel discussion presented at the UT COVID-19 Conference, Austin, TX, November 2020

**COVID-19 Environmental Effects and Technology Convergence** | Junfeng Jiao, Kerry Kinney, Dev Niyogi, and Suzanne Pierce | Panel Discussion presented at the UT COVID-19 Conference, Austin, TX, November 2020

**Environmental Effects and Technology Convergence in the Built Environment** | Kerry Kinney | Oral presentation presented at the UT COVID-19 Conference, Austin, TX, November 2020

**Remote Collection of Samples and Data for SARS-CoV-2 Surveillance in Homes and Other Buildings** | Kerry Kinney | Oral presentation presented at the UT COVID-19 Conference, Austin, TX, November 2020

**Wastewater-Based Epidemiology as a Tool to Detect Community-Scale COVID-19 Prevalence** | Mary Jo Kirisits | Oral presentation presented at the UT COVID-19 Conference, Austin, TX, November 2020

**Future Directions in Understanding Human Volatilome** | Pawel Misztal | Oral presentation presented at the Indoor Air 2020, Seoul, South Korea, November 2020

**Impact of COVID-19 on the Civil Infrastructure and Citizen Needs in Austin, TX** | Zoltan Nagy | Oral presentation presented at the UT COVID-19 Conference, Austin, TX, November 2020

**Discrimination and Well-Being in Adolescents' Daily Lives** | Aprile Benner | Oral presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**Key Challenges to Unpacking the Relations between Racial/Ethnic Discrimination and Adolescents' Well-Being** | Aprile Benner | Oral presentation, Los Angeles, CA, March 2021

**The Protect Texas Together Mobile Application** | Cameron Craddock | Oral presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**Chemistry of Homes: Environmental Microbes and Moisture** | Emma Hall | Oral presentation presented at the Environmental and Water Resource Engineering Research Seminar Series, Austin, TX, January 21, 2021

**Project MoveSMART: A Cooperative Educational Game to Increase Physical Activity in Elementary Schools** | Christine Julien | Oral presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**Automatic Risk Factor Detection for Externalizing Disorders from Naturalistic Audio** | Priyanka Khante | Oral presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**SARS-CoV-2 RNA Signal Distribution in Surfaces and Dust in a Quarantine Home** | Juan Maestre, David Jarma, Sharon Horner, and Kerry Kinney | Oral presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**Correlates and Digital Phenotypes of College Student Loneliness: Evidence from the UT1000 Project** | Congyu Wu | Oral presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**Mobile Sensing to Detect, Prevent, and Treat Depression in Transition-Aged Youth** | Cara Young | Oral presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**Discrimination and Health in Adolescence and Young Adulthood** | Aprile Benner | Oral presentation presented at the Education and Health Disparities Working Group, Austin, TX, April 2021

**Environmental Sensing** | Sergio Castellanos, Pawel Misztal, and Dev Niyogi | Oral presentation presented at the Whole Communities-Whole Health Interdisciplinary Seminar Series, Austin, TX, July 22, 2021

**How Does Indoor Air Quality Affect Sleep Quality?** | Hagen Fritz | Oral presentation presented at the Graduate Student Symposium, Austin, TX, March 2021

**Ventilation and Indoor Air Quality in Residential Bedrooms** | Hagen Fritz, Kerry Kinney, David Schnyer, and Zoltan Nagy | Oral presentation presented at the ASHRAE Annual Conference 2021, Phoenix, AZ, June 2021

**Geographic Information System (GIS) Technologies to Understand and Promote Health** | Junfeng Jiao, Zoltan Nagy, and Zhanmin Zhang | Oral presentation presented at the Whole Communities-Whole Health Interdisciplinary Seminar Series, Austin, TX, May 10, 2021

**What's in Your Cleaner and Why Should You Care?** | Pawel Misztal | Oral presentation presented at the Invited Webinar in the series of "Aerosols, Fomites, and Air Quality: what research says about the impact of cleaning on health," Cleaning Industry Research Institute, Virtual webinar, June 24, 2021

**The Effects of a Global Pandemic on Individuals' Physical Activity and Sleep Habits** | Brett Baker | Poster presentation presented at the UT COVID-19 Conference, Austin, TX, November 2020

**Mitigating Exposure to Indoor Air Pollutants from Disinfection Events** | Daniel Blomdahl | Poster presentation presented at the UT COVID-19 Conference, Austin, TX, November 2020

**Chemical Exposure to Disinfection Byproducts Interacting on Personal Face Masks and Indoor Surfaces** | Daniel Blomdahl, Emma Hall, Nirvan Bhattacharyya, Mengjia Tang, Leif Jahn, Shahana Khurshid, Atila Novoselac, Lea Hildebrandt Ruiz, Richard Corsi, David Allen, and Pawel Misztal | Poster presentation presented at the Indoor Air 2020, Seoul, South Korea, November 2020

**Parent Perceptions of Child Physical Activity and Physical Education During Quarantine** | Sheri Burson | Poster presentation presented at the UT COVID-19 Conference, Austin, TX, November 2020

**Exploring the Relationship between Multiple Indoor Air Pollutants and Sleep Quality in University Students** | Hagen Fritz, Sepehr Bastami, Kerry Kinney, David Schnyer, and Zoltan Nagy | Poster presentation presented at the Indoor Air 2020, Seoul, South Korea, November 2020

**SARS-CoV-2 Contamination of Surfaces and Dust in a Home with COVID-19 Cases** | David Jarma, Juan Maestre, and Kerry Kinney | Poster presentation presented at the UT COVID-19 Conference, Austin, TX, November 2020

**Ultrasensitive VOC Measurements in University Offices: Insights into Variability of Indoor VOC Concentrations and Indoor Air Quality** | Shahana Khurshid, Emma Hall, Daniel Blomdahl, David Jarma, Kerry Kinney, Ciara McAfee, Atila Novoselac, Robert Josephs, and Pawel Misztal | Poster presentation presented at the Indoor Air 2020, Seoul, South Korea, November 2020

**Understanding Endogenous and Exogenous Volatile Organic Compounds in Human Breath with Respect to Indoor Air Quality** | Pawel Misztal, Emma Hall, Daniel Blomdahl, Sarah Haines, Caleb Arata, Nijing Wang, Allen Goldstein, Jonathan Williams, Karen Dannemiller, Pawel Wargocki, Gabriel Beko, Atila Novoselac, Kerry Kinney, and Rachel Adams | Poster presentation presented at the Indoor Air 2020, Seoul, South Korea, November 2020

**Emission of Volatile Byproducts from Ozone Removal Filters** | Mengjia Tang, Atila Novoselac, and Pawel Misztal | Poster presentation presented at the Indoor Air 2020, Seoul, South Korea, November 2020

**Mitigating Exposure to Indoor Air Pollutants from Disinfection Events** | Daniel Blomdahl | Poster presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**Transitioning Physical Activity Motivational Web Game to Online Learning** | Dylan Bray | Poster presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**Promoting Physical Activity During Remote Learning** | Sheri Burson | Poster presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**Recruitment Strategies for Low-Income, Minoritized Participants in a Study with Wearable Sensing Technology** | Dominique Egger | Poster presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**Exploring the Relationship Between Multiple Indoor Air Pollutants and Sleep Quality** | Hagen Fritz | Poster presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**The UTx000 Study: An Ecologically Valid, Multimodal Dataset** | Hagen Fritz | Poster presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**Sensing Everyday Activity: Parent Perceptions and Feasibility** | Adrian Luong | Poster presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**Distribution of SARS-CoV-2 RNA Signal in Surfaces and Dust in a Quarantine Home** | Juan Maestre | Poster presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020

**Detecting Eating Episodes by Tracking Jawbone Movements with a Non-Contact Wearable Sensor** | Edison Thomaz | Poster presentation presented at the Whole Communities-Whole Health Research Showcase, Austin, TX, December 2020



# GRANTS AND AWARDS

---

To date, the team has received \$6.6M in external grants, gifts, and awards for Whole Communities–Whole Health-related research. Of this funding, \$1.4M was received in FY21, and is listed below. Whole Communities–Whole Health has also contributed its expertise to more than \$2.8M of other externally funded research projects and centers at The University of Texas at Austin, as well as \$238,000 in grants awarded to our community partners.

---

**Texas Department of Family and Protective Services**

“Father’s Playbook Mobile App”

**\$299,000**

---

**National Institutes of Health – National Institute of Mental Health**

“Testing FIRST in Youth Outpatient Psychotherapy (R01)”

**\$1,106,787**

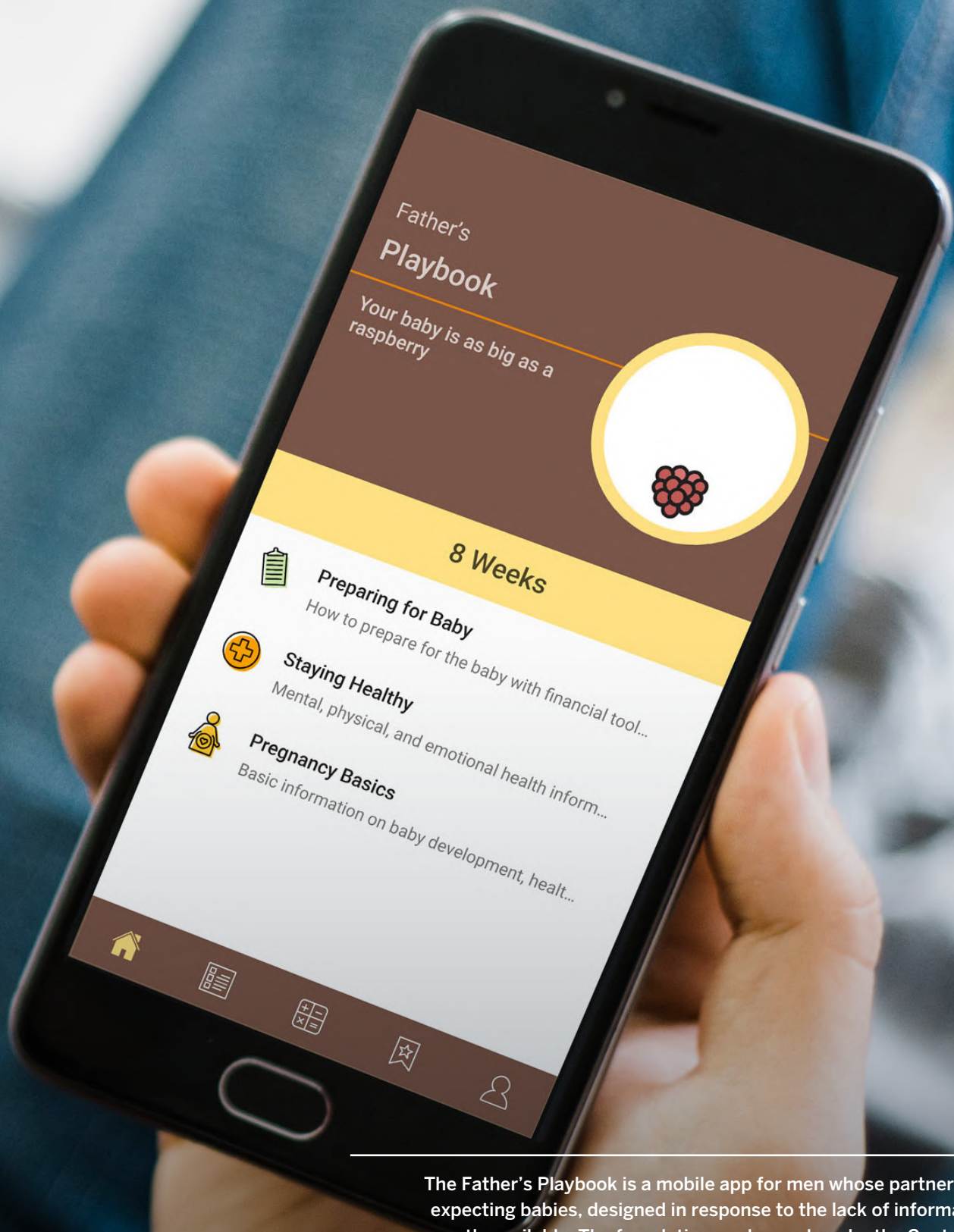
---

**St. David’s Corporation**

Texas Health Communication Survey

**\$12,000**

---



The Father's Playbook is a mobile app for men whose partners are expecting babies, designed in response to the lack of information currently available. The foundation work was done by the Center for Health Communication and the SAGA team at UT Austin and the Texas Safe Babies team at The University of Texas Health Science Center Tyler.





Charles Moody, founder and CEO of Community Coalition for Health, speaks at a panel about Whole Communities–Whole Health community engagement at the LBJ School of Public Affairs Opportunity Forum in 2019.

# OUR COMMUNITY PARTNERS

- Action for Healthy Schools
- Action for Healthy Kids
- Any Baby Can
- Austin Boys and Girls Club
- Austin Independent School District
- Austin Public Health
- AVANCE
- Building and Strengthening Tenant Action (BASTA)
- Blackland Community Development Corporation
- Boomers Collaborative
- Central Health
- Central Texas Food Bank
- CommUnity Care
- Community Coalition for Health
- Del Valle Independent School District
- Dell Children's Medical Center of Austin
- El Buen Samaritano
- Gus Garcia Young Men's Leadership Academy
- It's Time Texas
- Lone Star Family WIC Markets
- Mana Sana Vibrant Woman
- MEASURE
- People's Community Clinic
- Pflugerville Independent School District
- Round Rock Independent School District
- Sentier
- Sickie Cell Association
- Travis County Community Center in Del Valle
- Travis County Fire and Rescue
- United Way for Greater Austin
- Volunteer Healthcare Clinic
- YMCA of Austin

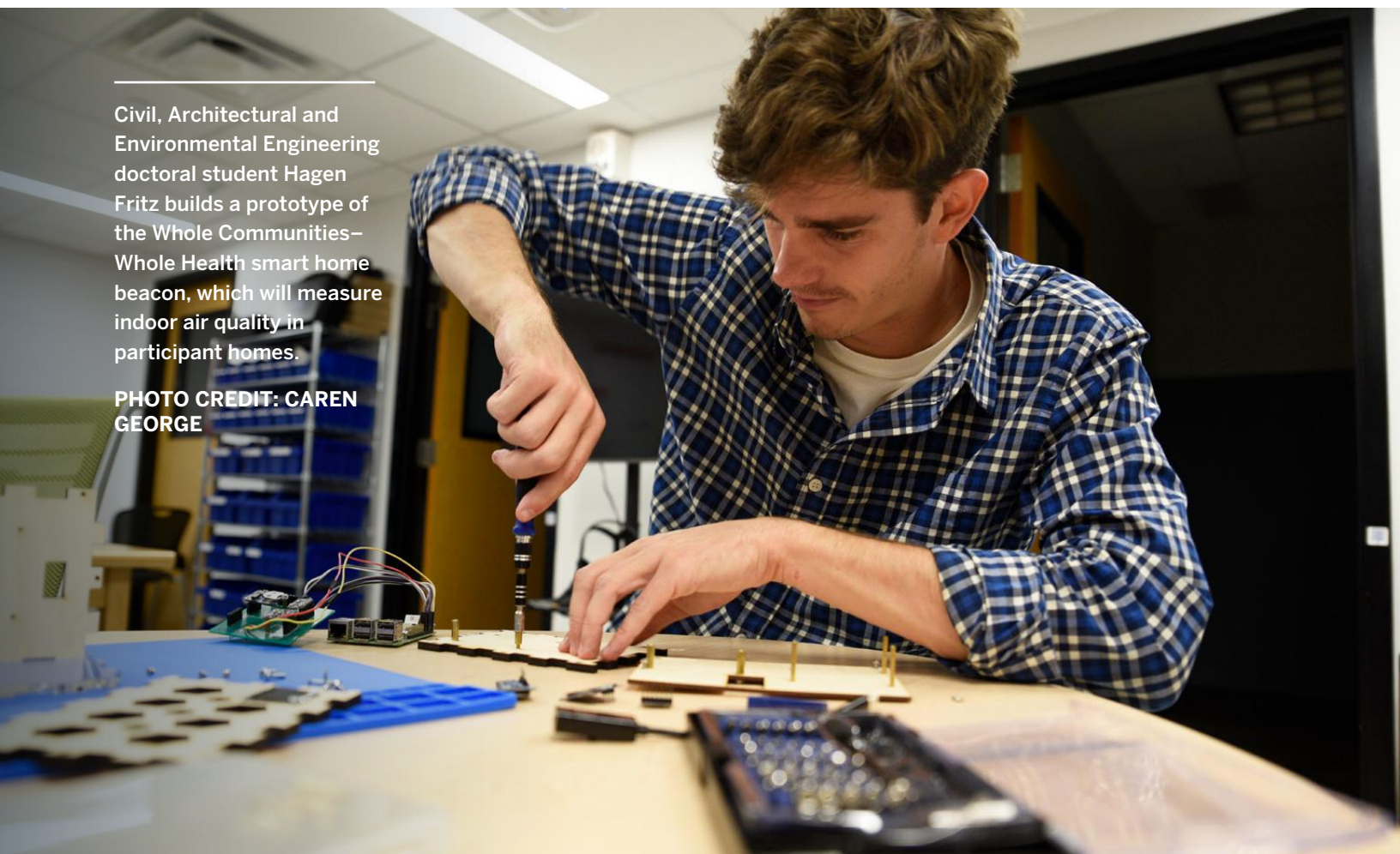
# PARTICIPATING COLLEGES, DEPARTMENTS AND UNITS

- Cell and Molecular Biology
- Center for Health Communication
- Center for Water and the Environment
- Civil, Architectural and Environmental Engineering
- Communication Studies
- Computational Engineering
- Computer Science
- Curriculum and Instruction
- Diagnostic Medicine
- Educational Psychology
- Electrical and Computer Engineering
- Health Behavior and Health Education
- Human Development and Family Sciences
- Information Studies
- Kinesiology and Health Education
- Operations Research and Industrial Engineering
- Psychology
- Population Health
- School of Nursing
- Steve Hicks School of Social Work
- Sociology
- Stan Richards School of Advertising and Public Relations
- Surgery and Perioperative Care

---

Civil, Architectural and Environmental Engineering doctoral student Hagen Fritz builds a prototype of the Whole Communities–Whole Health smart home beacon, which will measure indoor air quality in participant homes.

**PHOTO CREDIT: CAREN GEORGE**





# WHOLE COMMUNITIES—WHOLE HEALTH LEADERSHIP

**Gigi Awad**

Educational Psychology

**Sarah Kate Bearman**

Educational Psychology

Psychiatry

**Darla Castelli**

Co-Chair, Kinesiology and Health Education

**Frances Champagne**

Psychology

**Karen Johnson**

Nursing

**Kerry Kinney**

Co-Chair, Civil, Architectural and Environmental Engineering

Population Health

**Karla Lawson**

Surgery and Perioperative Care

Population Health

**Michael Mackert**

Advertising and Public Relations

Population Health

**Zoltan Nagy**

Civil, Architectural and Environmental Engineering

**David Schnyer**

Psychology

Psychiatry

**Sean Upshaw**

Advertising and Public Relations







<https://bridgingbarriers.utexas.edu/>