

How a mother's data can help countless children

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In Rhode Island, when pregnant women are ready to deliver their babies, 80% of them check in at Women & Infants in Providence, making it one of the largest obstetrical care hospitals in the country. If kids need urgent

care, parents can rush them to Hasbro Children's Hospital, which handles 90% of pediatric hospitalizations in the state. Nearby, Bradley Hospital is devoted to child and adolescent mental health.

There is no other state in the nation where so much of the population's medical care takes place in an area that is, in effect, akin to the campus of a single medical school—in this case Brown's Warren Alpert Medical School, which includes each of the three among its teaching hospital affiliates.

To build on the unique opportunity offered by that continuity of care, the Brown-based Hassenfeld Child Health Innovation Institute commenced in 2017 an eponymous study of pregnant women and their babies over time. The original prenatal cohort of [the Hassenfeld Study](#) gathers data from pregnant women in their first or second trimester and follows them until after delivery. The study's postnatal cohort, launched two years later, focuses on women after they have delivered at Women & Infants. Participants agree to share demographic information, provide saliva and [blood samples](#), and complete regular surveys about their [health](#).

To date, more than 1,000 women have enrolled, with between 40 and 60 new moms and their infants continuing to join each month. This treasure trove of data enables researchers to look for patterns and make predictions about maternal and child health.

For example: What factors that affect pregnant women with asthma (such as stress, diet, sleep and genetics) may predict the development of asthma in their children? What newborn behaviors may be related to developmental delays? Are babies born in a certain ZIP code more likely to experience a specific health issue? How do socioeconomic and racial/ethnic disparities during a mother's pregnancy and in the first year of a child's life affect that child's health and development?

"The Hassenfeld Study is a rich source of data that can be used to answer important questions as well as seed additional studies on pressing child health issues," said Patrick M. Vivier, a public health and medicine professor at Brown who directs the Hassenfeld Institute.

In 2019 alone, nearly \$15 million in federal grants was awarded to Brown scholars affiliated with the Hassenfeld Institute for studies that rely on the birth cohorts. Among those, from the National Institutes of Health awarded Brown research teams \$6.9 million to investigate the developmental origins of child health disparities; \$3.5 million to identify better ways to diagnose glucose metabolism abnormalities in pregnancy; and \$4.1 million to analyze infant cry acoustics and neurobehavioral characteristics as early markers of autism spectrum disorder.

To support the Brown scholars who conduct studies like these, the Hassenfeld Institute convenes a team of clinicians and researchers to collect and analyze the data, as well as to turn ideas into funded, staffed projects.

"For those of us who came to Rhode Island because it's such a wonderful place to study population health, the Hassenfeld Institute allows us to make that goal a reality," said Dr. Erika Werner, an associate professor at Brown who directs maternal fetal medicine at Women & Infants.

"We've come so far: We have a skilled technician who gathers biological specimens such as saliva and blood, we have experts in [data analysis](#), we have knowledgeable teammates who help us use this information to apply for grants."

Werner, a member of the institute's executive committee, has used the Hassenfeld Study to inform her research about [pregnant women](#) with gestational diabetes and health interventions to prevent childhood obesity.

And the potential for insights to be generated with the Hassenfeld Study data has enabled the institute to help local partners solve a range of real-world problems affecting Rhode Islanders.

When the office of former Rhode Island Gov. Gina Raimondo needed help in understanding reading proficiency among third-graders, its staff came to the Hassenfeld Institute. Experts in the institute's core research and evaluation unit were able to conduct a retrospective study to assess risk factors in infancy and determine how they were associated with reading proficiency years later. Their analysis informed strategies to meet the state's goal of having 75% of third-graders reading proficiently by 2025.

When the Rhode Island Community Food Bank wanted to learn more about the people the organization served (a quarter of whom are children), its leaders, too, came to the institute. Researchers designed a survey, trained volunteers to administer it to more than 400 people and then analyzed results. One of the key survey findings was that 45% of respondents reported significant health-related issues, underscoring the fact that children need nutritious food to thrive.

"We were blown away by the institute's incredible expertise," said Andrew Schiff, CEO of the food bank. "The 2019 hunger survey provided a much more detailed portrait of the families for whom our programs are structured. It changed in a profound way our sense of responsibility for making sure we were providing the healthiest possible food to our patrons and also that we continue to collaborate with health care providers."

In a separate project, Hassenfeld Institute scholars analyzed Medicaid claims data to identify geographic hot spots for childhood asthma, allowing researchers to find connections with neighborhood characteristics such as poverty and old housing. They've also mapped the

prevalence of childhood obesity by town, prompting community-based groups to pursue initiatives such as improving the nutrition of school lunches.

The Hassenfeld Study has provided opportunities to assess the impact of new and emerging threats as well. By the end of 2020, 241 mothers enrolled in the study had completed a COVID-19 pandemic survey, the results of which are providing important insights on the public health side effects of COVID-19. After learning that 70% of moms said they had higher stress levels compared to before the pandemic, and that 19% of children had missed in-person doctor's appointments, the institute offered webinars on topics like wellness routines for kids during COVID.

The study data shouldn't only be useful to research partners, Vivier said: "We try to make this information available as soon as possible to advise, reassure and guide families across the state—and beyond."

Provided by Brown University

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