

Battelle Health and Analytics

SCIENCE FOR A HEALTHIER HUMAN RACE



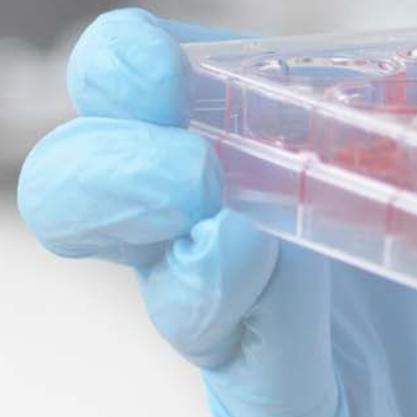
BATTELLE

For decades, organizations concerned with healthcare quality and public health have counted on Battelle for solid science and experienced laboratory support. The Battelle Health and Analytics team brings together the world's best people, facilities and methods to improve public health and patient outcomes.

WHEN THE ANSWERS MATTER, TRUST BATTELLE.

Our Clients

- Centers for Disease Control and Prevention (CDC)
- National Institutes of Health (NIH)
- Food and Drug Administration (FDA)
- Environmental Protection Agency
- Department of Health and Human Services
- U.S. Armed Forces
- Defense Health Agency
- Department of Veteran's Affairs
- National Cancer Institute





**TECHNICAL
ON-SITE
PROFESSIONAL
SERVICES**

**BEHAVIORAL
HEALTH
SERVICES**

**PUBLIC HEALTH
CENTER FOR
SUBSTANCE USE
RESEARCH**

**PUBLIC HEALTH
SUPPORT
SERVICES**

**What
We Do**

**HEALTHCARE
QUALITY
IMPROVEMENT**

**HEALTHCARE
ANALYTICS**

**MILITARY
HEALTH**

**REPOSITORY
MANAGEMENT**



WE'RE IMPROVING HEALTHCARE
QUALITY AND PATIENT OUTCOMES.



Healthcare Quality Improvement

Battelle works with agencies such as the Centers for Medicaid and Medicare Services (CMS) and the Department of Veteran's Affairs (VA), along with hospitals and healthcare providers, to provide objective and meaningful information to improve healthcare quality.

- Healthcare Quality Measures
- Clinical Predictive Analysis
- Outcomes Research
- Lab Medicine Process Improvement

Healthcare Quality Indicators

Our healthcare quality indicators, developed in partnership with the Agency for Healthcare Research and Quality (AHRQ), are helping to make healthcare more effective and affordable.

WayFinder™ Q.I. Dashboard

WayFinder is a cloud-based quality improvement analytics tool that allows hospitals to quickly analyze trends, determine benchmarks, predict performance and easily compare performance to peers, both state- and nationwide.

Public Health Support Services

Our research has long been trusted to guide program development and public policy for organization such as CDC, NIH, EPA and many more. We support critical public health research and program development with expert evaluation, on-the-ground support and subject matter expertise for a wide variety of public health programs.

Program Evaluation

From tobacco cessation to childhood obesity, Battelle has been chosen to evaluate a wide range of large or complex public health programs. Our team combines deep experience in public health policy and program development with advanced data collection and analysis methods to provide deep insight into program efficacy.

Health Communications

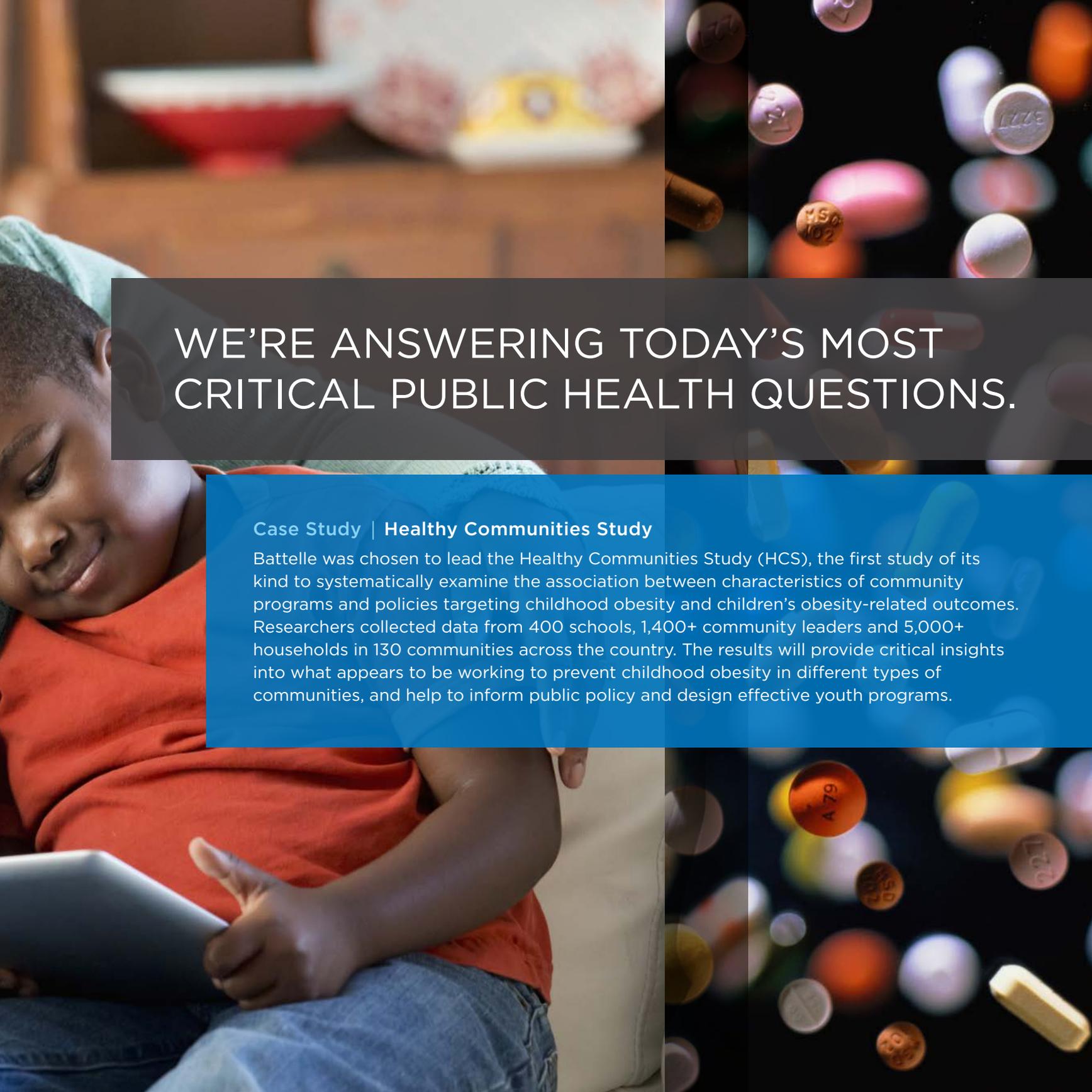
Our health communications experts can help you reach your target population with accurate, effective and easy-to-understand health information. We develop effective communication campaigns and educational programs to help people understand complex issues and make better health decisions for themselves and their families.

Behavioral Health Services

Battelle's experienced, credentialed researchers have led some of the most complex and important studies in behavioral health, on topics ranging from maternal health to nicotine addiction.

- Substance Use/Abuse
- Health Promotion/Disease Prevention
- Nutrition/Physical Activity/Obesity
- Maternal/Child Health
- Mental Health
- Environmental Exposure/Health
- Individual Exposure/Health





WE'RE ANSWERING TODAY'S MOST CRITICAL PUBLIC HEALTH QUESTIONS.

Case Study | **Healthy Communities Study**

Battelle was chosen to lead the Healthy Communities Study (HCS), the first study of its kind to systematically examine the association between characteristics of community programs and policies targeting childhood obesity and children's obesity-related outcomes. Researchers collected data from 400 schools, 1,400+ community leaders and 5,000+ households in 130 communities across the country. The results will provide critical insights into what appears to be working to prevent childhood obesity in different types of communities, and help to inform public policy and design effective youth programs.



WE'RE APPLYING NEW METHODS
TO SUBSTANCE USE RESEARCH.



The Battelle Public Health Center for Substance Use Research

The Battelle Public Health Center for Substance Use Research brings together the world's best researchers, facilities and methods to help the public health community understand the range of tobacco, marijuana and opioid products available, how consumers use those substances and the risks associated with them. Our research focuses on some of today's most critical—and complicated—clinical and behavioral questions, such as:

- What are the human health risks associated with different product types, exposure routes and dosages for tobacco, marijuana, opioids and other compounds?
- How do changes in user behavior or product characteristics impact exposure risks?
- How do co-dependencies on tobacco, marijuana and opioids impact user behaviors and health risks?

Evaluating Product Characteristics and Exposure Risks

Accurately characterize tobacco, nicotine, marijuana and opioids products and evaluate how their physical and chemical properties impact human exposure risks.

- **Product Characterization:** Our state-of-the-art laboratory includes organic and inorganic analytical instruments and innovative characterization technologies for measurement of volatile and semi-volatile organic compounds (VOCs/SVOCs), heavy metals, particulates and tobacco-specific nitrosamines.
- **Smoking Topography Studies:** We use a sophisticated puff analyzer to build a precise “puff profile” for each individual smoker of tobacco-related products. Smoking topography allows us to better measure how smoking behavior impacts exposure and how products influence puff behavior.
- **Human Exposure Studies:** We use biomarkers in human breath, saliva and blood to measure the exposure effects of different products on the human body. Our smoking chamber provides a controlled environment for accurate measurement of exposure levels in both direct and secondhand smoke and aerosol exposure studies of tobacco products.

Connecting the Dots Between Substance Use Behavior, Exposure and Risk

Get a clear understanding of how smokers consume tobacco, marijuana and opioids, including combustible forms, and how substance use behavior is impacted by product design. Analyzing both pharmacokinetic and pharmacodynamics interactions, our experts can close the gap between product characteristics, user behavior and acute and chronic exposure to toxicants.

- **User Behavior:** We conduct both survey and observational studies to understand how users actually consume different kinds of tobacco, nicotine, marijuana and opioids and how product characteristics impact their behavior and choices.
- **User Perception:** We use sophisticated survey and observational methods to measure user perception for a variety of products and evaluate how perception influences user behavior.
- **Dependence and Withdrawal:** We study dependence and withdrawal behaviors and symptoms for different kinds of tobacco, marijuana and opioids to better understand how product characteristics influence addiction.

Healthcare Analytics

We leverage sophisticated analytical, computational and bioinformatics methods to help you identify meaningful and relevant patterns, determine which programs and policies are most effective, and make informed and timely decisions. Our integrated services include statistical and semantic methods of analysis, modeling and simulation, and high-performance computing capabilities for effective data acquisition, analysis and integration.

Environmental Health Research

From chemical exposure to climate change, we provide impactful solutions to characterizing environmental risks, exposures, and pathways to humans, and assessing their impact on human health. Our research has been used to set EPA priorities for chemical exposure and help private and public entities balance and manage environmental risks.

- TSCA characterization
- Data collection, design and management
- Exposure studies
- Statistical design, modeling and analysis

Battelle Sematrix™

When you need deep understanding of a topic, Sematrix can help. An automated system that can rapidly collect, process and accurately identify granular scientific and technical knowledge, Sematrix can provide answers to complex questions. The output is stored as linked axioms in a semantic knowledgebase that can be queried and visualized to:

- identify and track targets (e.g. scientists, domains, topics);
- identify knowledge gaps, biases and tendencies;
- discover tacit or hidden patterns of relationships between scientists, organizations, and research activities.





WE'RE TRANSLATING DATA INTO ACTIONABLE INFORMATION.

Case Study | Analyzing Climate Change Vulnerability in India

Climate change is increasing the intensity and duration of heat waves in many places around the world, putting vulnerable populations at risk. Older, sicker and poorer people are especially vulnerable to the effects of extreme heat. Battelle researchers analyzed satellite data showing surface temperatures across New Delhi to create a detailed hour-by-hour heat map of the city. Policy makers can use this data to recommend changes such as urban greening, cool roof construction and increased water availability to increase the resiliency of vulnerable neighborhoods, as policy makers have done with results from a similar project focused on Philadelphia.





LET OUR PEOPLE HELP
YOUR PEOPLE.



Technical On-Site Professional Services

Our experienced personnel keep your labs and facilities running smoothly so your scientists can stay focused on your core mission. We put qualified lab workers, managers and scientists to work in your environment to support your goals.

- Analytical chemists and biological lab workers, epidemiological program managers and other specialties to meet your needs
- Management services including ongoing staff oversight, search and recruiting services, safety observations, program management, staff education and reviews
- Implementation and oversight of quality systems

Lab Developed Testing

Put our world-class diagnostic laboratory services to work. We have extensive experience with the regulatory support process, and can assist in bringing diagnostic assays through FDA clearances or to a desired state where they are ready for rapid submission in the event of an emergency.

- FDA clearances and assistance – 510(k) & EUA
- Novel *in vitro* assay development, including multi-plex assays

Repository Management

If you need to maintain and preserve critical biological samples, Battelle can help. We are highly experienced in repository management, including management of high-risk biological specimens.

- Specimen collection, processing and storage
- Inventory management
- Distribution
- Quality assurance

Battelle provides ongoing oversight and management for CASPIR, the largest repository of biological specimens in the U.S. A joint project for the Centers for Disease Control (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR), the biological library holds more than 6 million specimens, including blood, urine, tissue and DNA, many of them unique in the world.

Military Health

From infectious disease to occupational and environmental exposures, threats to military health are both challenging and complex. Battelle delivers solutions to help military personnel identify, understand, prepare for and mitigate the most challenging military health threats.

Areas of specialty:

- Occupational and Environmental Health
- Military Force Health Protection
- Exposure Science
- Emergency and Medical Readiness

Advanced DOEHRS Coaching

Our Advanced DOEHRS Coaching was developed to help DoD clients ensure that personnel are ready to implement effective industrial hygiene practices and Defense Occupational and Environmental Health Readiness System (DOEHRS) surveillance programs. This hands-on coaching has been crafted and improved through 5 years of delivery at dozens of U.S. Air Force bases.

Surety Medicine

Battelle is working with the Army Public Health Center to combat threats to military personnel caused by weapons of mass destruction. Our team brings together nationally recognized physicians, emergency and trauma nurses, quality improvement nurses, hazardous materials (HAZMAT) technicians and paramedics with more than 200 years of collective experience supporting the U.S. Army chemical warfare agent (CWA) stockpile and disposal program.





PROTECTING THOSE WHO PROTECT
US EVERY DAY.



Who is Battelle?

We are the world's largest independent research and development organization, operating at the forefront of scientific discovery. Our people apply cutting-edge research methods to some of today's most complex public health and healthcare challenges.

Experience: We operate at the forefront of health and analytics research and are a trusted research provider for NIH, CDC, FDA and many other public and private entities.

Expertise: We bring together leading experts in data analytics, public health, pharmacology, medical readiness and other related disciplines for a multidisciplinary approach to healthcare and public health research.

Objectivity: Our research is grounded in solid, objective science and proven methods. We provide accurate, trusted data to guide healthcare providers, policy makers and regulatory agencies.

What can we answer for you today?

solutions@battelle.org

www.battelle.org/public-health

Every day, the people of Battelle apply science and technology to solving what matters most. At major technology centers and national laboratories around the world, Battelle conducts research and development, designs and manufactures products, and delivers critical services for government and commercial customers. Headquartered in Columbus, Ohio since its founding in 1929, Battelle serves the national security, health and life sciences, and energy and environmental industries. For more information, visit www.battelle.org.

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ID 524 09/17



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It can be done