

SOCIAL SCIENCE AND HUMAN FACTORS FOR TOBACCO PRODUCTS

Investigating the Human Side of Tobacco Product Use



How do tobacco product characteristics correlate with consumer behaviors, comprehension, perceptions of risk and actual risk?

The tobacco industry needs science-based answers to make effective product development and policy decisions that reduce harm and prevent foreseeable misuse of tobacco products. Battelle applies decades of experience and proven methods in social and behavioral science and human factors engineering to give both tobacco companies and policy makers the answers they need.

We can help you answer critical questions about:

- Consumer preferences and behaviors
- Consumer comprehension of packaging and labeling
- Perceptions of risk by users and non-users
- Risk-based use behaviors and foreseeable misuse

THE BATTELLE ADVANTAGE

Battelle brings a unique set of skills and experience to the industry. Our experts put social and behavioral findings into a broader context so you can understand how user behaviors, comprehension, perception and risk are intertwined. Our approach to study design enables you to gather multiple data sets—such as social science and clinical data—from the same subjects to keep costs down and condense study timelines.

- **Tobacco and Nicotine Research:** Battelle has been a leader in tobacco and nicotine research for more than 50 years. We understand the regulatory environment and the chemistry, pharmacokinetics and pharmacodynamics of tobacco and nicotine products, so we can help you put it all together.
- **Social and Behavioral Science:** We have decades of experience in behavioral and social science research for many public health topics, including use and abuse of tobacco, nicotine, marijuana and other substances. Our researchers know how to recruit representative populations, ask the right questions, and use science-based data collection methodologies to collect accurate, reliable user data that answers your specific questions.

- **Human Factors Engineering:** We apply methods honed in the medical device industry to understand how people interact with products in the real world and how use behaviors correlate with consumer risks. We can help you identify improvements to product characteristics that decrease the chances of accidental or intentional misuse.

OUR SERVICES

We provide end-to-end service, from study design to recruiting, execution and data analysis. Our capabilities include:

- User surveys
- In-depth interviews
- Focus groups
- Observational studies
- Biometric data collection (e.g., eye tracking)
- Human use topography

Tobacco and Nicotine Product Experience

- Electronic Nicotine Delivery Systems (ENDS) (e-cigarettes, vapes)
- Oral nicotine products (lozenges, etc.)
- Smokeless tobacco products
- Water pipe/hookah
- Combustible products (cigarettes, cigars, etc.)



BATTELLE

Helping you understand the complex interaction between products, users, behaviors, perceptions and environment

User Behavior	<ul style="list-style-type: none"> • How product characteristics correlate with user behaviors and abuse potential • User behaviors among different demographic groups, including youth • User behaviors in different use environments, such as home, community settings and mobile environments • Self reported vs. observed user behaviors • Consumer preferences
User Perceptions	<ul style="list-style-type: none"> • How product and packaging characteristics influence perceptions of risk among users and non-users • How risk perceptions correlate with actual use behaviors • How different populations (such as youth or non-users) perceive risk
Human Factors	<ul style="list-style-type: none"> • Consumer risks associated with product design • Foreseeable misuse (accidental or intentional) • User comprehension of instructions for use or consumer warnings • Risk reduction options

END-TO-END SOLUTIONS FOR THE TOBACCO INDUSTRY

Battelle offers a comprehensive suite of services for tobacco companies. We design and execute studies that give you the answers you need to make business decisions, improve the safety and quality of your products and maximize your chance of a smooth regulatory submission.

Product and Device Development

- Verify product formulations for quality assurance
- Test for shelf stability and reactions with device components (e.g., leachables/extractables)
- Identify HPHCs in product formulations and byproducts produced during combustion or heating

Chemistry

- Conduct validated, regulatory-compliant chemical analysis for accurate characterization of all types of tobacco and nicotine products
- Provide novel chemical analysis and method development to meet unique analytical needs and improve testing sensitivity, precision or speed

Nonclinical and Clinical Studies

- Identify, detect and quantify biomarkers of concern in blood, urine, saliva, breath and tissue for nonclinical and clinical studies
- Conduct analyses to support exposure studies (inhalation toxicology, second-hand/third-hand exposure)

Social Science

- Connect behavioral factors with biomarker analyses to build a more complete picture of product PK/PD

Post-Market Surveillance

- Conduct failure/root cause analysis for investigations of adverse events
- Provide support for product reformulation to address problems with product safety, stability or performance



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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