

Appendix A: Information about Mental Models Research and Expert Model Developed from Stakeholder Interviews

The purpose of this document is to provide additional information about Mental Models research and to provide the mental model developed from interviews with stakeholders during the first phase of this research.

The concept of mental models is a well-established theory in psychology and has been the focus of extensive research. A person's "mental model" can be thought of as a complex web of deeply- and often subconsciously-held beliefs, which affect how an individual defines a problem, reacts to information, forms judgments and makes decisions. These beliefs may be complete and correct, or they may have gaps that are consequential to decision making and action. Decades of research has shown that to effectively engage people and enable changes in their beliefs and behaviors, one must understand and change their mental models. Over the past 30 years, researchers have used the mental models method to guide the design and implementation of communications strategies related to a diverse set of health and safety issues including those related to Good Agricultural Practices (GAPs) for produce safety, plastic surgery, obesity, impacts of climate change extreme heat events, and child vaccinations.

As a research method, the mental models approach begins with the elicitation of the knowledge of experts on a given topic. The previous study conducted, *Stakeholder Interviews for Break the Chain Retailer Education Campaign*, elicited information from experts associated with academic institutions, federal and state government, retailer associations, and public health associations. The knowledge gathered was then integrated to create an expert model, which provides a formal representation of how situations or problems are understood, capturing the range of legitimate expert opinion and uncertainty. Expert models are essential tools for decision making, and are especially well-suited to complex health-focused risk and communications challenges. A common form of depicting the expert model is an influence diagram, which describes a decision-making system in terms of variables and the relationships among them, as they relate to the outcomes of interest to stakeholders. In the case of the sale, distribution and marketing of cigarettes and smokeless tobacco products to youth, this decision-making system may focus on how tobacco retailers, at all levels – from owners, trainers and managers, to clerks – make a number of decisions that ultimately influence the degree to which youth are protected from the effects of tobacco. For example, these decisions may include staff education and communication and checking identification.

The Expert Model will serve as the analytical framework for the design and analysis of in-depth research with tobacco retail clerks and managers, allowing for direct comparison between experts and retail clerks/supervisors' mental models of those complex issues and decision-making situations. Additionally, the Expert Model aided in development and refinement of the key topics and questions that will be explored with retailers and clerks in the subsequent research activities with these audiences.

Below is the Expert Model developed from the stakeholder interviews.

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