MEASURING CHANGES IN PATTERNS OF TOBACCO PRODUCT USE OVER TIME: TRANSITION PROBABILITY APPROACHES

Afolaru EF, Prieto L de La Bourdonnaye G, Sponsiello Wang Z, Weitkunat, R
PMI R&D, Philip Morris Products S.A. Quai Jeanrenaud 5, CH-2000 Neuchâtel, Switzerland (part of Philip Morris International group of companies)

BACKGROUND

Measuring patterns of tobacco use has typically involved assessing number of units and frequency of use of cigarettes. With the emergence of new types of products (e.g., e-cigarettes, heat-not-burn products), multiple combinations of product use can occur, and this makes the quantification of exposure to tobacco/nicotine and associated outcomes intricate. In addition, measuring transitions in patterns of use over time presents analytic challenges.

OBJECTIVES

- To identify analytic approaches that have been used to characterize patterns and combinations of use of tobacco/nicotine containing products
- To describe the applicability and limitations of these approaches in measuring transitions in product use patterns

METHODS

A scoping review and literature search was conducted on PubMed to identify suitable analytic approaches, using search terms capturing concepts associated with pattern of use behavior (e.g., tobacco OR smoking OR e-cigarette) AND transitions.

To guide the description of these analytic approaches, use of four broad groups of tobacco/nicotine containing products (Figure 1) was considered with a longitudinal study design to assess patterns of product use over time, where the possibilities of single, dual, or multiple product use, occasional and daily use, initiation, cessation, and switching between products may also be considered.

OVERVIEW OF FINDINGS

The review identified 18 relevant articles and four analytical approaches, namely - Kaplan-Meier survival analysis, Markov state transition models, cluster analysis, and latent class/transition analysis.

CONCLUSIONS

A scoping review identified four possible analytic approaches to characterize transitions across complex tobacco product use patterns.

 Depending on the research question, Kaplan-Meier and Markov state transition approaches may be suited to define and track specific use behaviors over time, whereas cluster and latent class analysis may provide broader interpretable insight into key use patterns across a population.

Future research should consider the feasibility and applicability of these approaches to describe patterns of product use and associated outcomes, especially including the use of novel potential reduced risk products such as e-cigarettes and heat-not-burn products.