Modeling the impact of an existing Tobacco product with a Modified-Risk Claim on Population Health

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FDLI

MRTPA Statutory Requirements (§ 911(g)(1))

- The candidate product, as it is actually used by consumers, will:

1. Significantly reduce harm and the risk of tobacco-related disease to individual tobacco users; and

2. Benefit the health of the population as a whole taking into account both users of tobacco products and persons who do not currently use tobacco products.

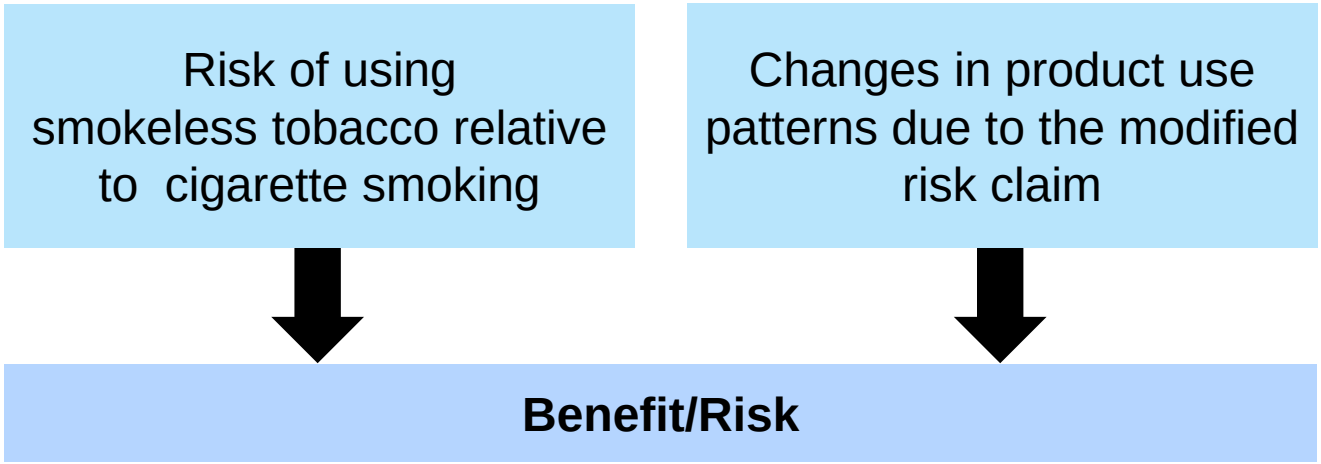
"**FDA encourages** the development and application of innovative analytical methods to make preliminary estimates of the potential effects of some change in the marketplace. Methods ….include secondary data analyses and **computational modeling**."

Source: Food and Drug Administration Center for Tobacco Products, 2012: Guidance for Industry - Modified Risk Tobacco Product Applications: Draft Guidance. Center for Tobacco Products.

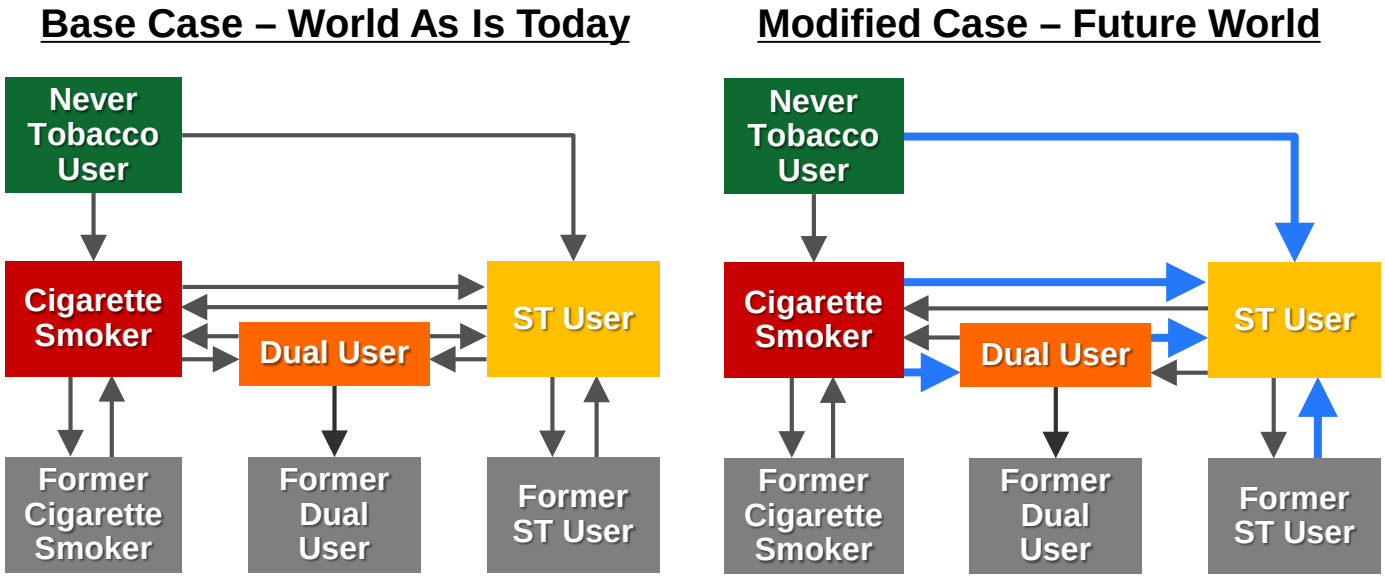
Copenhagen® Snuff Fine Cut – Proposed Claim

1. **Draws the attention of adult smokers**
2. **Single disease focus**
   Neither states nor implies that the product presents no risk of lung cancer or other disease
3. **Desired single use behavior**

Modeling the Impact of the Claim



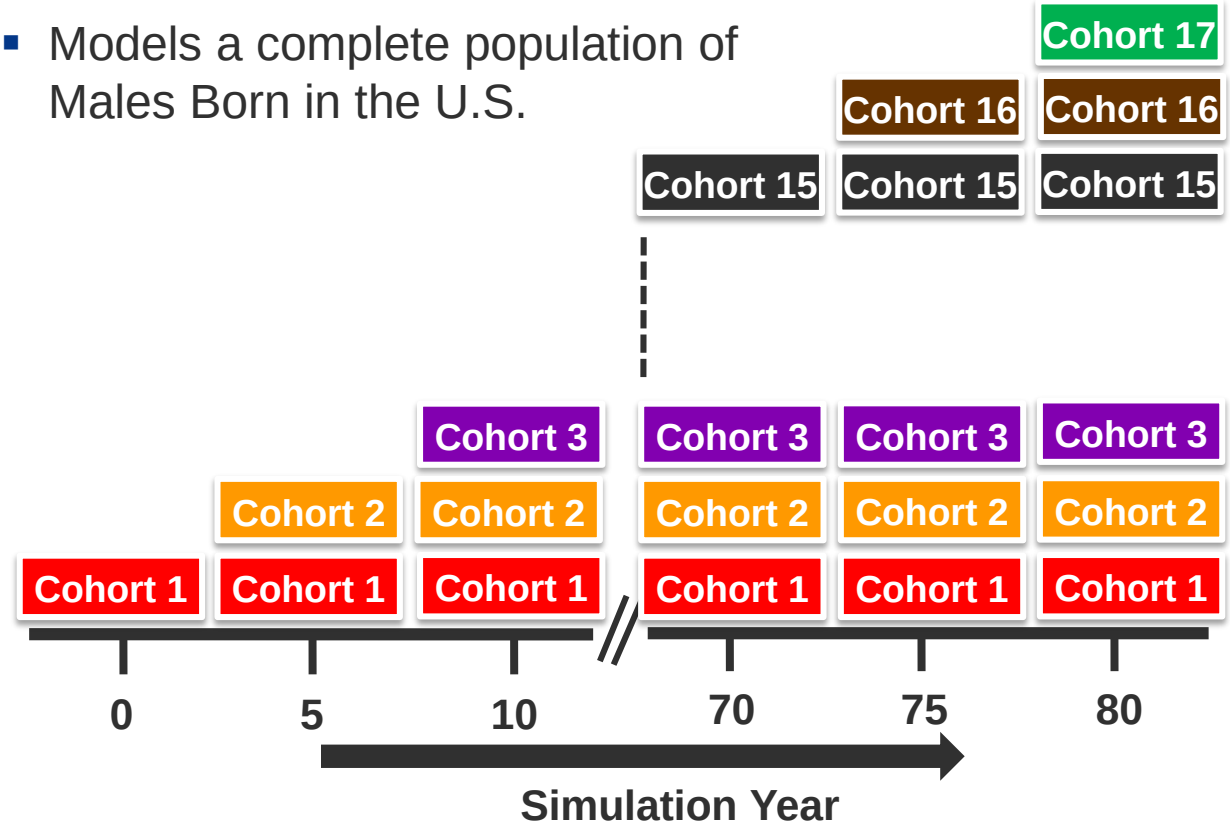
Modeling Framework

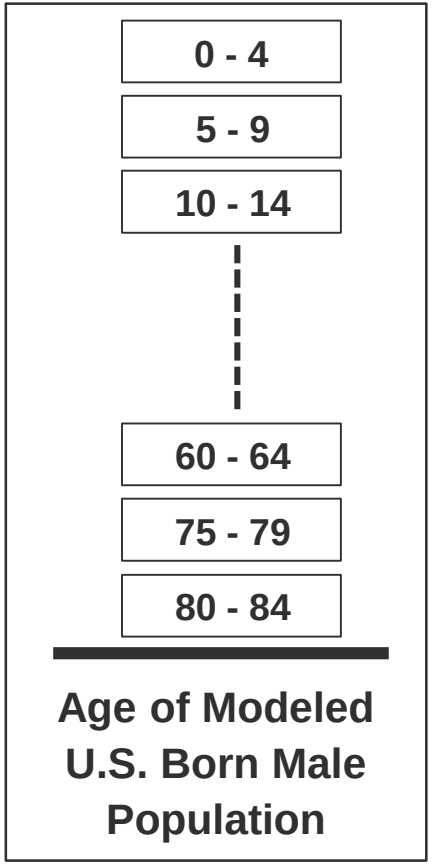


Estimate population benefit/risk by comparing the difference in All-cause Mortality between the Base Case and Modified Case

Time-Staggered Multiple Cohort Approach

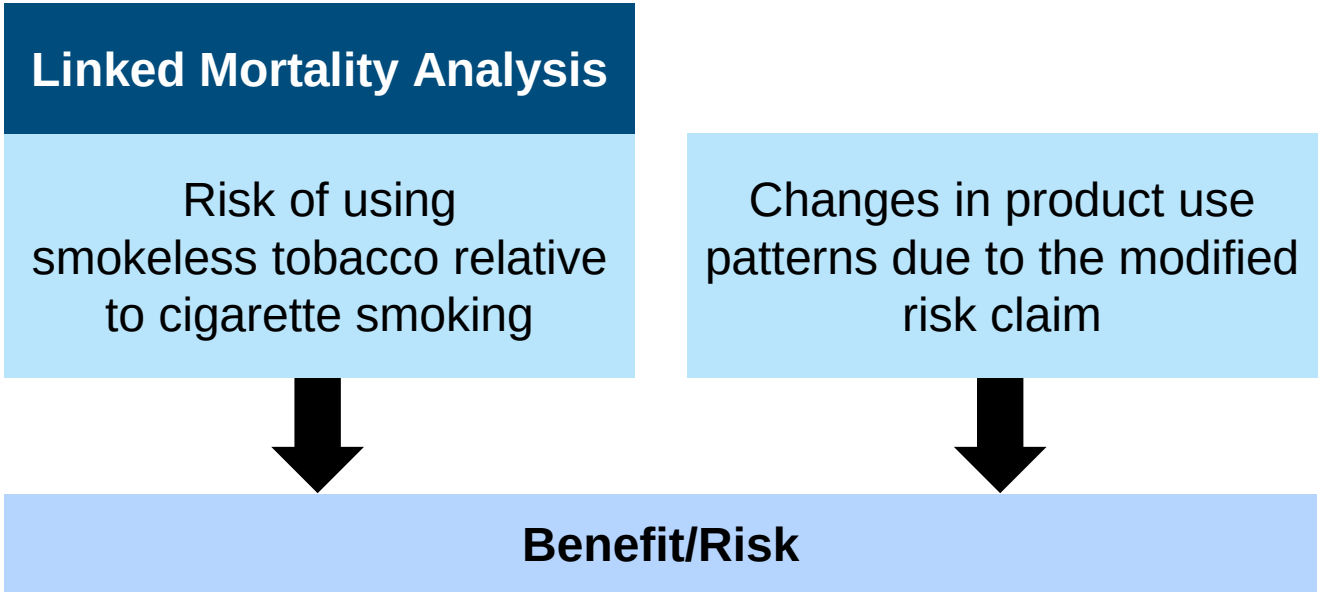
- Models a complete population of Males Born in the U.S.





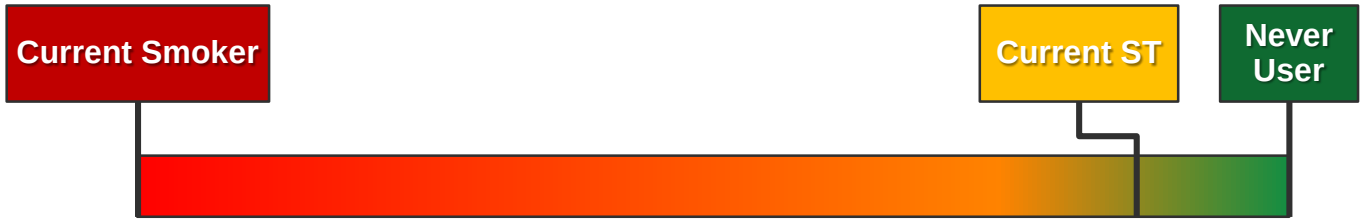
Single Cohort Approach based on: Bachand, Annette M.; Sulsky, Sandra I., (**2013**) A dynamic population model for estimating all-cause mortality due to lifetime exposure history. Regul. Toxicol. Pharmacol. 67;2

Modeling the Impact of the Claim



Risk of Smokeless Tobacco (ST) Use Relative to Cigarette Smoking

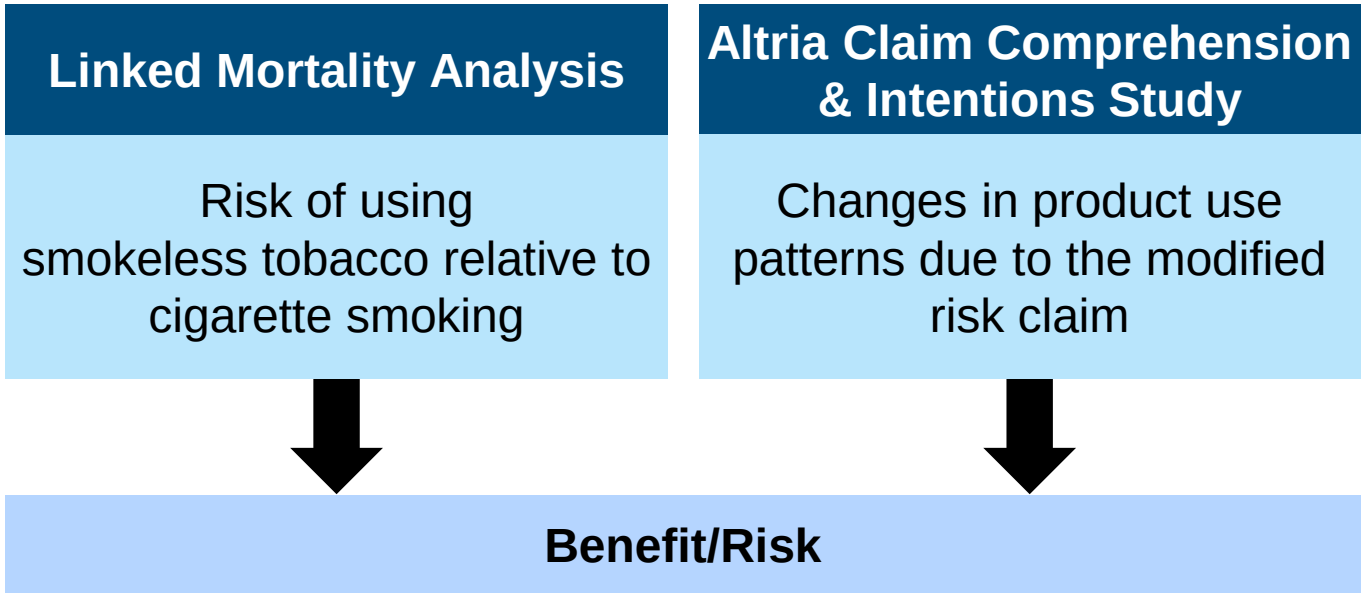
- The increased likelihood of all-cause mortality estimated from ALCS Linked Mortality Analysis*



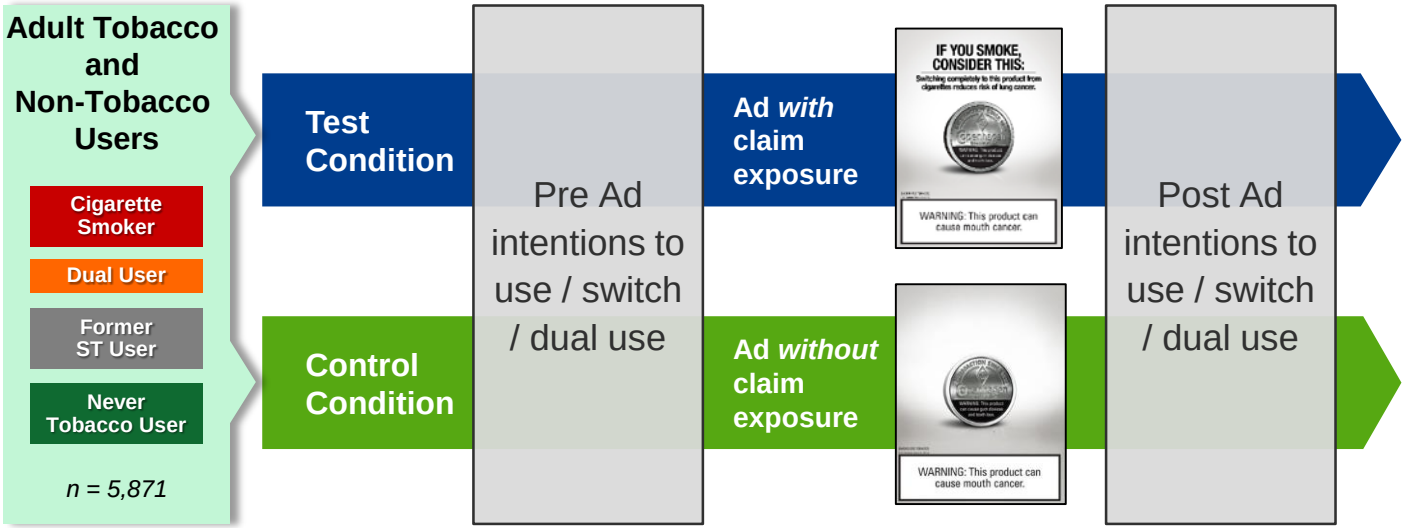
- We estimated the risk for Smokeless Tobacco Use to be 9% of Cigarette Smoking

*Fisher, M.T.; Tan-Torres, S.M.; Gaworski, C.L.; Black, R.A.; Sarkar, M., (**2019**) Smokeless tobacco mortality risks: An analysis of two contemporary nationally representative longitudinal mortality studies. Harm Reduct. J. 16;27

Modeling the Impact of the Claim



Altria Claim Comprehension & Intentions Study (CCIS)



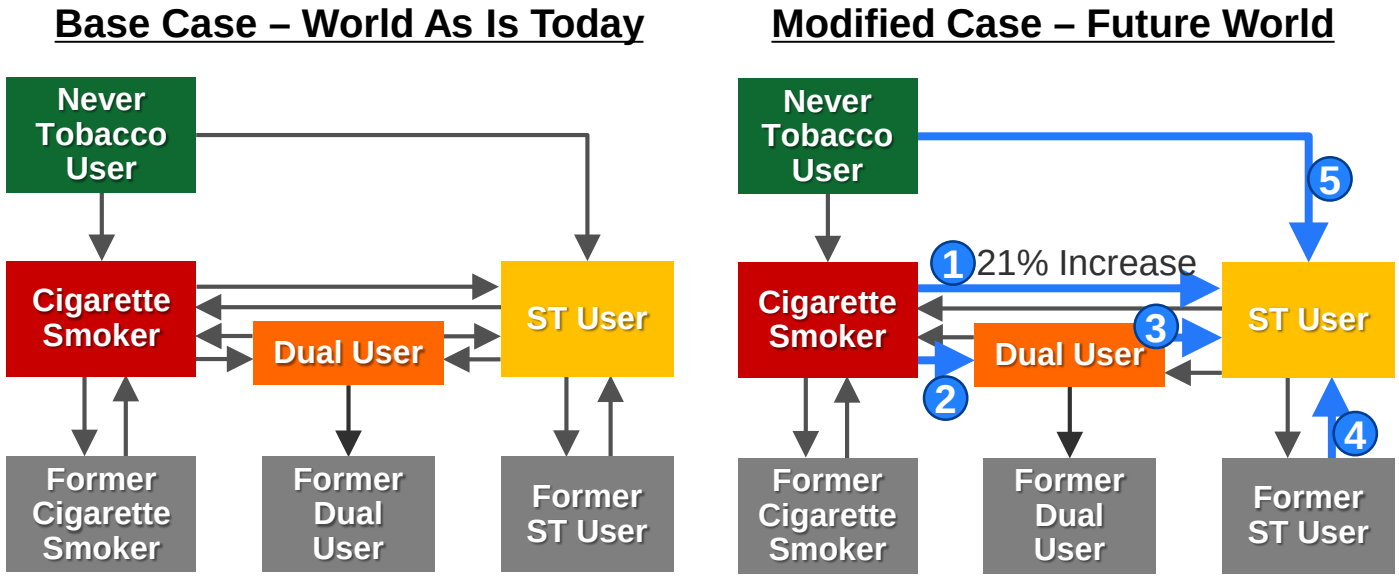
- Estimate relative percent difference between response of Test and Control group
- Applied the estimated relative percent differences to Base Case transition rates to generate the Modified Case transition rates

Relative Impact

	Adult Tobacco Use Behavior	Change in Likelihood of Behavior* (Relative Impact Factor)
1	Cigarette Smokers Switching to Copenhagen® Snuff	1.21
2	Cigarette Smokers Transitioning to Dual Use	1.25
3	Dual Users Switching to Copenhagen® Snuff	1.06
4	Former Smokeless Tobacco Users Relapsing to Copenhagen® Snuff	1.00
5	Never Users Initiating with Copenhagen® Snuff	0.94

*Results not statistically significant.

Modeling Framework



Adult Male Transition Rates

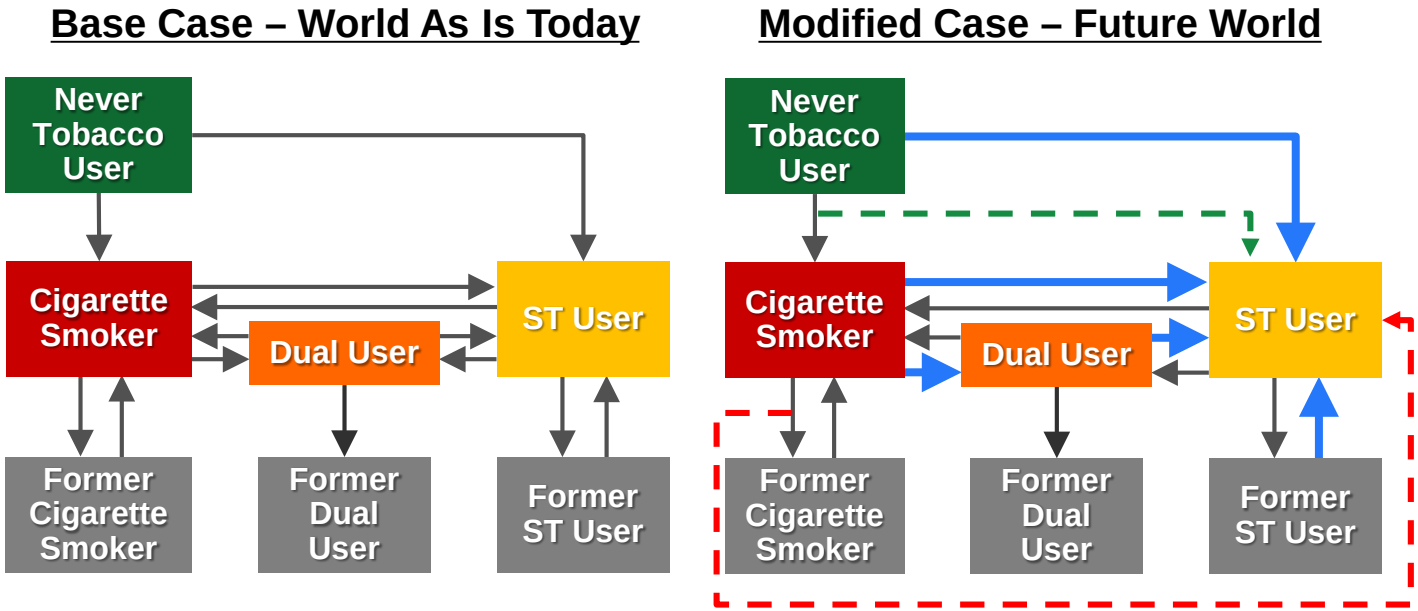
	Tobacco Use Transition	Base Case Transitions* (From the Literature)	Modified Case Transitions* (Adjusted from CCI Study)
1	Current smoker → ST	1.4%	1.7%
2	Current smoker → Dual user (ST + cigarettes)	3.2%	4.0%
3	Dual user → ST	17.4%	18.4%
4	Former ST → ST	1.8%	1.8%
5	Never user → ST	1.6%	1.5%

21% Increase

*Five year transition rates

Base case transition rates largely informed by Tam J., Day H.R., Rostron B.L., Apelberg B.J. A systematic review of transitions between cigarette and smokeless tobacco product use in the United States. BMC Public Health. 2015;15:258

Modeling Framework

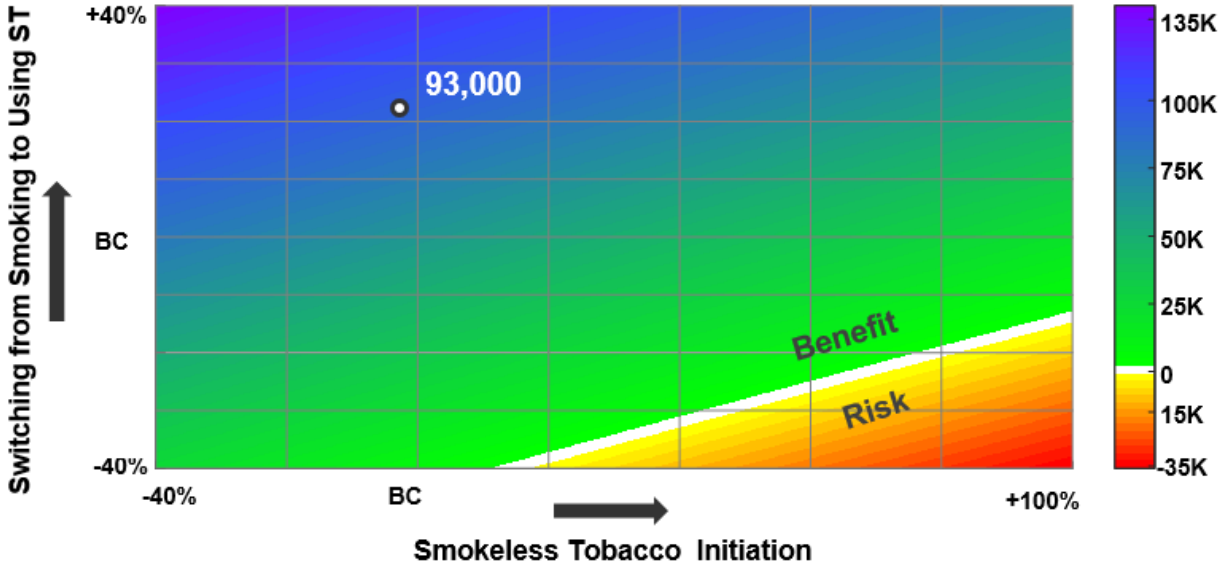


Approximately 93,000 premature deaths prevented over 60 years following claim authorization

Sensitivity Analysis

- Concurrently vary:
  - Change in rate of Never Tobacco Users initiating on smokeless tobacco (*Initiation*)
  - Change in rate of Cigarette Smokers switching to smokeless tobacco (*Switching*)

- All other transition rates kept the same as those in the Modified Case scenario



Summary

- Models can serve as important tools for evaluating population health impact
- Sensitivity Analysis is important in examining the robustness of model projected outcomes

FDA Remarks on Population Health Benefit

FDA: “Computational modeling estimated a relatively small net population health benefit from market authorization of Copenhagen Snuff Fine Cut with the proposed modified risk claim.”

Source: FDA TPSAC presentation slide 49.

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Article

A Computational Model for Assessing the Population Health Impact of Introducing a Modified Risk Claim on an Existing Smokeless Tobacco Product

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