

Nicotine Reduction and Consumer Perception: A Scientific Approach for Quantifying Possible Impact of Low Nicotine Cigarettes on Consumer Behaviour



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1. INTRODUCTION

In 2015, the WHO Study Group on Tobacco Product Regulation (TobReg) issued an advisory note¹ recommending a strategy to reduce nicotine in tobacco to levels which would not be sufficient to lead to the development and/or maintenance of addiction. In 2018, the FDA issued an ANPRM seeking public input for developing a potential nicotine product standard that would reduce the current level of nicotine in cigarettes, and potentially other combustible products. The product standard would result in a de facto ban on products subject to the nicotine standard.

Nicotine plays a role in the smoking experience (sensory effect, taste, aroma, etc.). Several publications report that reduced nicotine cigarettes are unsatisfactory for smokers². Thus, reducing nicotine in cigarettes will immediately create a stronger incentive for that consumer to seek out illegal cigarettes that deliver what the consumer wants.

We developed a dynamic population model to quantify possible behavioural changes of smokers in response to a potential product standard that reduce the current level of nicotine in cigarettes.

2. SATISFACTION & MODELLING

Satisfaction

Consumer attitudes, beliefs, and social reactions toward a product will affect their behavioural responses to a product. It is argued that Reduced Nicotine Cigarettes (RNC) may support smoking cessation. Some scientific studies report that quit attempts in smokers interested in quitting can be supported by the use of RNC cigarettes³. However, some sensory perception studies mentioned cigarettes described as containing “low” and “very low” nicotine content provided less craving and more negative subjective rating on several sensory items⁴. Furthermore, some smokers rated these cigarettes as “less strong, less flavorful, less satisfying and less harmful, and of poorer quality compared to their preferred brand” and most smokers did not like RNC cigarette for, in particular, unpleasant taste and smell of them.

The notion of dissatisfaction is important because a market place where cigarette smokers had no access to satisfying products, cigarette with nicotine or adequate alternative nicotine-containing products may further exacerbate the global illicit market in cigarettes.

Modelling

The global process, called Dynamic Population Modelling, embedded the conceptual model, the population birth rate and the mortality related to tobacco consumption. Its objective is to forecast the smoking prevalence related to RNC implementation according to different scenarios over time.

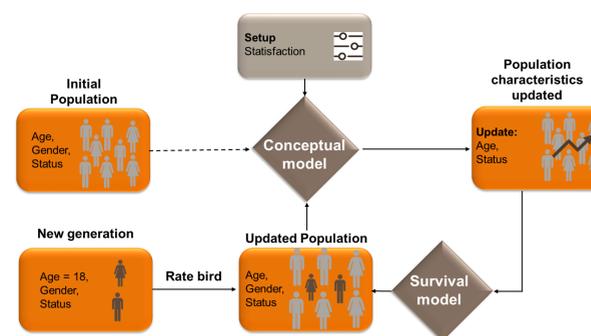


Figure 1
Global Process used for forecasting the smoking prevalence related to RNC implementation

3. SATISFACTION IMPACT

The impact of satisfaction can be assessed through the change of the parameters of transitions related to cessation and switching. Smokers not satisfied by RNC could stop smoking cigarette or switch to cigarettes with usual nicotine level (black market).

The figures 3 and 4 illustrate the impact of switching and cessation on prevalence in five-years time, according to dissatisfaction criteria. Figure 4 describes the four extreme consequences of dissatisfaction of RNC.

Acceptable alternative nicotine-containing products, like e-cigarettes, may increase the cessation rate.

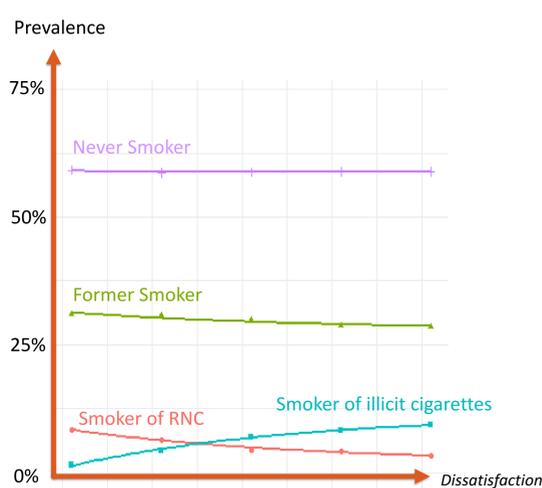


Figure 2: Dissatisfaction implies illicit consumption

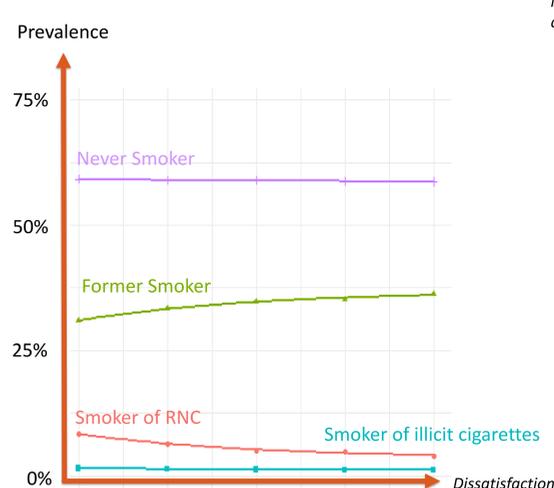


Figure 3: Dissatisfaction implies cessation

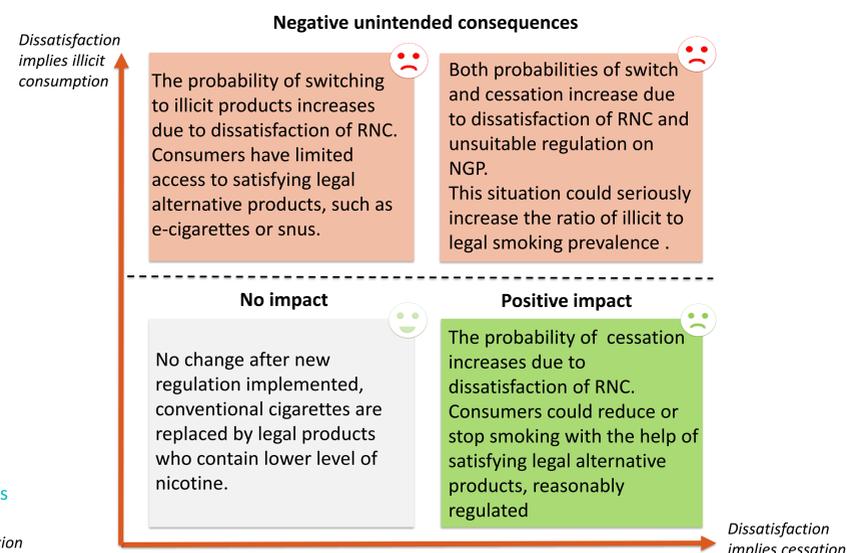


Figure 4: Four extreme consequences of dissatisfaction of RNC

4. CONCLUSIONS

We modelled possible behavioural changes of smokers in response to a potential product standard that reduce the current level of nicotine in cigarettes. Our dynamic population model predicts cigarette smokers acceptance, cessation or switching to illicit other trade products, including illicit ones. Baseline status transitions were derived from published data⁵. Several scenarios were considered to cover a range of probabilities for smokers to switch to illicit products. The impact on smoking prevalence and illicit trade over time was then simulated.

In this study, the notions of switching and cessation have been assessed on prevalence in five-years time i.e. 5 years after the implementation of a RNC standard. In both cases, lower levels of smokers satisfaction with RNC generate higher ratios of illicit versus legal product consumption.

Our results indicate that the implementation of RNC standard will likely create a substantial illicit market. These results will be adjusted by considering in addition the impact of risk perception, and the possibility for smoker to use alternative nicotine-containing products.

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