Factors associated with intention to initiate e-cigarette use and actual e-cigarette use initiation by current smokers, former smokers and non-smokers over six months

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INTRODUCTION

To evaluate the population health impact of electronic-cigarettes (EC), a survey instrument was developed for the purpose of predicting intentions to initiate EC use, tested against actual EC use, amongst adult current smokers (CS), former smokers (FS) and non smokers (NS).

A pilot study was conducted to assess the validity of the survey instrument in predicting the likelihood an individual will try an EC and to refine the survey items based on their ability to predict an individual's odds of initiating EC use (1).

METHODS

Participants aged between 19 and 64 were recruited via social media to complete the survey online. Participants who completed the survey at baseline were contacted again 3 and 6 months later to complete follow-up measures. Only current smokers were included in regression analyses as few former or non-smokers reported an intention to try an EC.

Response Variables

- Baseline (BL): Intention to use or try an EC in next 12 months
- 3 months (3M) and 6 Months (6M): Actual EC use in the past 3 months (i.e. even just one puff)

Data Analysis

- Item assessment was performed using binary logistic regression models (adjusted by age and gender) and odds ratios (OR) for the response variable were calculated. Table 1 (Item assessment).
- A predictive model was built using data from BL and the dependent variable 'Actual EC use' at 3 months. A logit GLM with stepwise selection was used to obtain the significant predictors. The model was tested to predict actual use at 6 months to assess the predictive ability of the model. Table 1 (Pred Model) and Table 2.

RESULTS

Intention to use at baseline and actual EC use

Baseline
Current smokers = 306
Former smokers = 77
Non-smokers = 148

Three months
Current smokers = 230
Former smokers = 55
Non-smokers = 120

Six months
Current smokers = 204
Former smokers = 46
Non-smokers = 113

Rate of frequent EC use (everyday ■, most days ■) at 3 and 6 months was similar between current and former smokers, but rare amongst non-smokers.

Table 1: Variables associated with current smokers' intentions to try an EC at baseline (BL OR) and actual use at 3 (3M OR) and 6 (6M OR) months. Item assessment   Prediction model of actual use.

	Variables	BL OR	3M OR	6M OR	*Pred Model OR
Smoking Related Predictors	Intention to quit smoking				
	Enjoyment of Smoking				
	Tried to quit in past year (Yes)			2.62	
	Perceived risks of stopping smoking				
	Perceived benefits of stopping smoking	2.50	1.74	1.86	
	Perceived likelihood of succeeding stopping smoking				
	Perceived likelihood of still smoking in 12 months				
	Personal fear that their smoking will cause cancer				
	Changes in health due to smoking			0.09	
	Opinions of smoking among close persons				
	Perception of smoking prevalence				
	Frequency of thoughts about harm of smoking				
	Frequency of smoking Urges Past 24 hours				
	Perceived Harm of Smoking 10 or more cigarettes per day			0.47	
	Belief that I will not die from a smoking related disease				
	Belief that most smokers die from a smoking related disease				
	Perceived harmfulness of smoking				
	Perceived addictiveness of smoking				
Perceptions of e-cigs	Age		1.03		
	Intention to initiate EC use (Yes)		3.94		3.56
	Perceived likelihood of short-term health harms				
	Perceived likelihood of long-term health harms	0.97			
	Perceived likelihood of becoming addicted to ECs			1.03	
	Positive expectancy of using an EC	3.61			
	Perceived likelihood of accepting a friend's offer of an EC				
	Encouragement from friends to try an EC (Yes)		2.71		1.54
	Sought information about ECs in a shop	4.06			
	Expected enjoyment from using an EC	1.29	1.33	1.28	1.60
Perceptions of e-cigs relative to cigarettes	Perceived short-term harms, ECs versus usual cigarettes				
	Perceived long-term harms, ECs versus usual cigarettes				
	Perceived Harm of secondhand vapour from ECs compared to smoke from cigarettes	0.73		0.52	
	Anticipated Satisfaction with ECs versus usual cigarettes	2.01			
	Perception of relative cost of ECs versus usual cigarettes	0.51	0.53		0.63
	Attractiveness of EC Flavours	1.29	1.34		

Green indicates significantly (p < 0.05) increased odds ratio (OR) and red indicates significantly reduced OR of intention (actual/predicted) of using an EC.
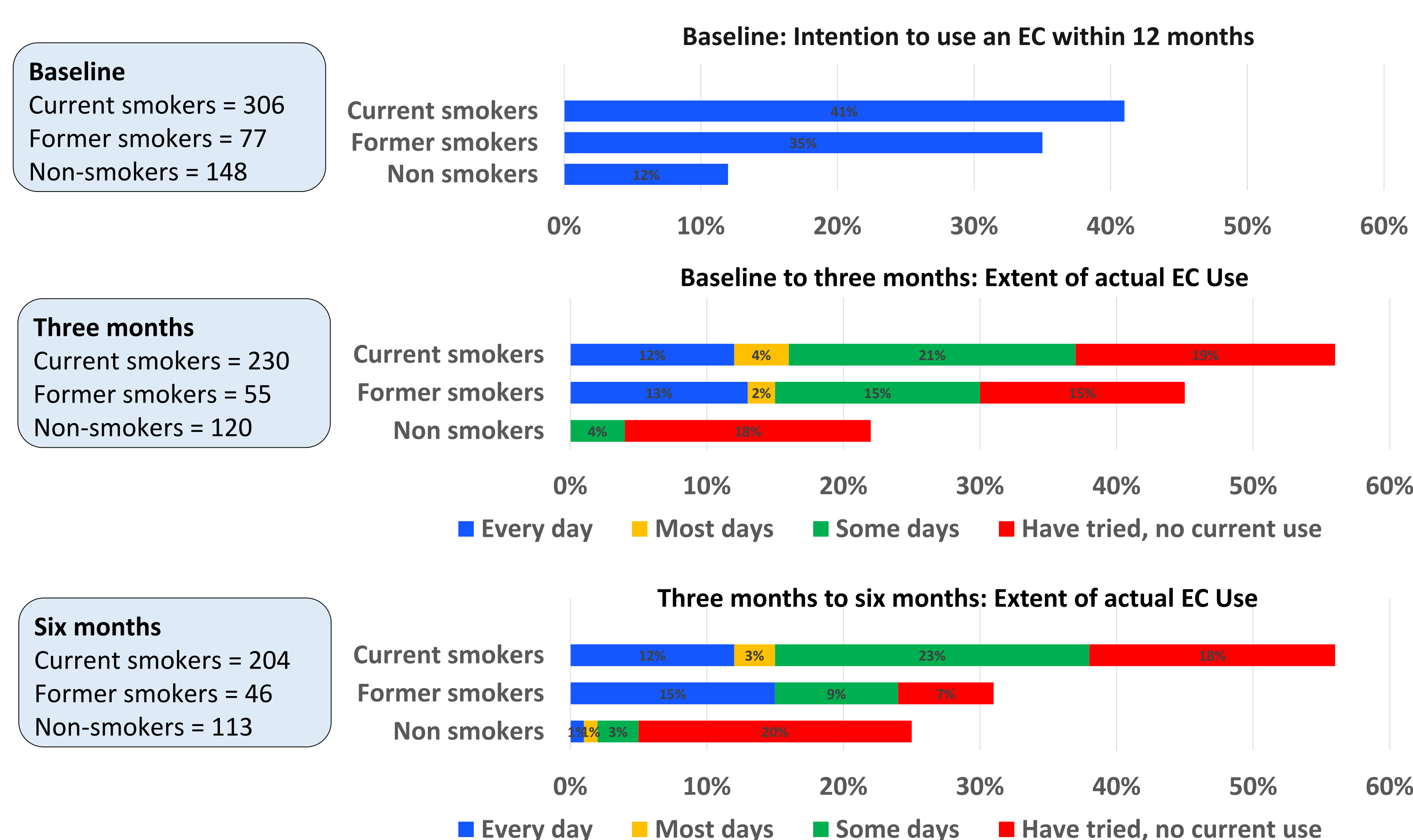
Table 2: Prediction Matrix

	Actual Yes	Actual No
Predicted Yes	77 %	60 %
Predicted No	23 %	40 %

The model could predict those who used an EC at least once (sensitivity=77%), however the false positive rate was quite high (60%).

CONCLUSIONS

- Rate of frequent EC use at 3 and 6 months was similar between current and former smokers, but rare amongst non-smokers.
- Quit attempts in the past year, expected enjoyment of EC use and perceived benefits of stopping smoking, seemed to predict both intention to initiate and actual use in current smokers.
- The model could predict those who used an EC at least once, however the false alarm rate was quite high.

References
1. Gale *et al.* Development of a Novel Survey Instrument to Assess Predictors of Intentions to Initiate E-cigarette Use. Poster presented at Global Forum on Nicotine Conference, June 17-18 2016, Warsaw, Poland

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