

Prevalence of heated tobacco product use in Japan: the 2020 JASTIS study

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ABSTRACT

Background Japan is the leading market for heated tobacco products (HTPs). We assessed the latest prevalence of HTP use including novel products (Ploom S, glo sens, and Pulze).

Methods Data were obtained from an internet-based, self-reported survey conducted during February–March 2020 with individuals aged 15–74 years in Japan (n=9044). Prevalence of current (past 30-day) HTP use and cigarette smoking was computed. Poisson regression analysis was conducted to examine predictors of HTP use among current cigarette smokers (n=1478). All analyses were weighted to account for selection bias in the internet survey using a nationally representative sample of Japanese population.

Results In 2020, prevalence of current HTP use and cigarette smoking was 10.9% and 25.9% in Japan, respectively. The most commonly used HTP brand was IQOS (5.7%) followed by Ploom TECH/Ploom TECH+ (5.4%) and glo (2.6%). Use of Ploom S, glo sens and Pulze was 1.6%, 0.8% and 0.6%, respectively. Among current cigarette smokers, 34.9% of those who were interested in quitting smoking and 30.5% of those who were not interested in quitting reported concurrent use of HTP, respectively (difference not significant). Cigarette smokers who reported having multiple chronic conditions (aPR=2.31), alcohol consumption (aPR=2.07), and e-cigarette use (aPR=1.88) were more likely to use an HTP compared to those who did not report such characteristics.

Conclusions HTP use remained prevalent in Japan. One in three current cigarette smokers used HTPs regardless of whether they were interested in quitting smoking. Continued surveillance is important to inform national and global tobacco control strategies.

INTRODUCTION

The prevalence of heated tobacco product (HTP) use in Japan skyrocketed 50-fold during 2015–2019, from 0.2% to 11.3%.¹ In 2019, novel HTPs such as Ploom S, glo sens and Pulze were launched by major tobacco companies which may further accelerate the expansion of the HTP market. HTPs are often advertised as less harmful alternatives to conventional cigarettes.² A previous assessment in 2017 shows that Japanese cigarette smokers were more likely to use HTPs when they had an intention to quit smoking, indicating that HTPs were used as a cessation aid.³ However, more recent report in 2019 suggests that HTP use has extended to Japanese smokers overall, including those who are not interested in quitting.¹ In light of these facts, the objectives of our study were to (1) assess the latest prevalence of HTP use in Japan and (2) examine

the predictors of HTP use among current cigarette smokers.

METHODS

An internet-based, self-reported survey of individuals aged 15–74 years in Japan was conducted during 9 February to 2 March 2020, as an annual follow-up of the longitudinal study on tobacco use behaviour. A total of 9044 individuals responded to the 2020 survey (response rate 63.6%). The data were analysed to provide a cross-sectional landscape of HTP use in 2020. Inverse probability weighting (IPW) was applied to account for the selectivity of internet-based samples. To obtain IPW, we calculated propensity scores for ‘being an internet survey respondent’ by fitting logistic regression models adjusted for basic demographic, socioeconomic, health-related and tobacco-use-related factors between the sample of the current internet survey and a widely used nationally representative sample (the Comprehensive Survey of Living Conditions of People on Health and Welfare).⁴ Further methodological details are reported elsewhere.^{5,6} We computed the prevalence of current (past 30-day) HTP use and cigarette smoking. Poisson regression analysis was conducted to examine the predictors of HTP use among current cigarette smokers (n=1478). Statistical significance was set at $p < 0.05$. All analyses were conducted using R V.4.0.2.

RESULTS

In 2020, 10.9% of all respondents reported current HTP use, and 25.9% reported current cigarette smoking (online supplemental table 1). The most commonly used HTP brand was IQOS (5.7%) followed by Ploom TECH/Ploom TECH+ (5.4%) and glo (2.6%) (online supplemental table 1). Use of Ploom S, glo sens and Pulze was 1.6%, 0.8% and 0.6%, respectively. One in three current cigarette smokers concurrently used an HTP: 34.9% and 30.5% of those with and without an intention to quit smoking, respectively (difference not significant). Among current smokers, older adults were less likely to use HTPs (adjusted prevalence ratio [aPR]=0.51 and 0.37 among those aged 50–59 years and 60+ years, respectively) compared with those aged 20–29 years. Smokers who reported having multiple chronic conditions (aPR=2.31), current alcohol consumption (aPR=2.07) and current use of e-cigarettes (aPR=1.88) were more likely to use an HTP compared with those who did not report such characteristics.



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DISCUSSION

We found that the prevalence of HTP use remained unchanged from 2019 (11.3%, reported by Hori *et al*)¹ to 2020 (10.9%), suggesting that the continuous increase in the past years has possibly slowed down or plateaued. However, this should be carefully monitored given the expanding availability of HTPs in the market. In face of declining cigarette smoking, tobacco companies market HTPs to attract young, non-tobacco users aiming to create a new form of tobacco consumption.^{2–7} Continued surveillance and stricter regulations are warranted to prevent and reduce the use of all types of tobacco including HTPs.

We observed higher prevalence of HTP use among current cigarette smokers, e-cigarette users and alcohol drinkers. Previous studies have demonstrated the 'gateway' effect of e-cigarettes that leads to the uptake and established use of combustible tobacco among adolescents and adults.^{8–9} Our findings suggest that e-cigarettes or HTPs may serve as a gateway product to subsequent use of the other product. While the relationship between HTP use and alcohol consumption is still understudied, it has been documented that the use of multiple tobacco products predicts increased risk of nicotine addiction and health-deteriorating behaviours such as binge drinking.¹⁰ Continued monitoring is required to examine the trajectory of HTP use and the use of other substances.

Notably, we did not observe significant difference in the prevalence of HTP use between smokers who had an intention to quit and those who did not. Considering that HTP use was lower among heavy smokers (smoked 21+ cigarettes/day) and higher among those who reported less intensive smoking (smoked 1–20 cigarettes/day), these findings suggest that smokers might use an HTP as a complement rather than an alternative to cigarettes. In Japan, the revised Health Promotion Law imposes more lenient regulations on HTP use in public places compared with those on

the use of combustible tobacco.¹¹ This could encourage smokers to use HTPs as complements in occasions where smoking is not allowed. It is important to monitor consumers' behaviour to assess the impact of the national tobacco control policies in place.

Our study was subject to the following limitations: first, as the study sample was collected through the internet-based survey, our findings may not be generalisable to the population with limited access/literacy to the internet; second, self-reported nature of the survey might have resulted in recall bias or misreport; third, we were unable to establish the causal relationships due to the cross-sectional nature of the analysis.

To conclude, our study underscores the high prevalence of HTP use in Japan and the possibility that HTPs are used as complements, not as alternatives to cigarettes. Given the growing HTP market in Japan and worldwide, continuous surveillance is warranted to inform global tobacco control strategies.

Contributors SO conducted data analyses and drafted the initial manuscript. Both SO and TT conceptualised the study and critically reviewed and revised the manuscript.

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What this paper adds

What is already known on this subject

- ▶ Heated tobacco products (HTPs) are often advertised as less harmful alternatives to conventional cigarettes.
- ▶ The prevalence of HTP use in Japan skyrocketed 50-fold during 2015–2019, from 0.2% to 11.3%.

What important gaps in knowledge exist on this topic

- ▶ It is unknown as to whether the increasing trend of HTP use has continued.
- ▶ HTP use might have become prevalent among cigarette smokers who are not interested in quitting.

What this paper adds

- ▶ The prevalence of HTP use during 2020 in Japan was 10.9%, indicating that the continuous increase has slowed down or plateaued.
- ▶ One in three current cigarette smokers concurrently used an HTP regardless of whether they had an intention to quit smoking.