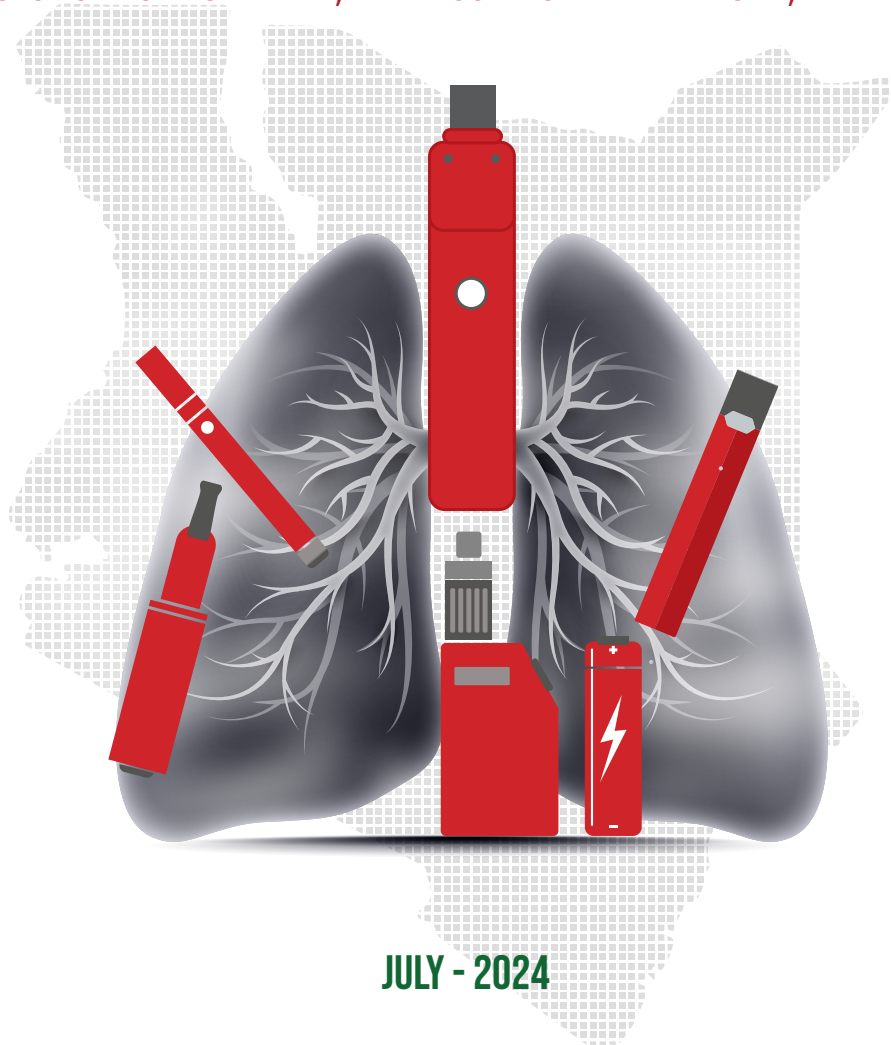




THE LANDSCAPE OF NEW-GENERATION TOBACCO AND NICOTINE PRODUCTS CONSUMPTION IN KENYA

CHALLENGES FOR PUBLIC HEALTH, TAX REGULATORY FRAMEWORK, AND WAY FORWARD



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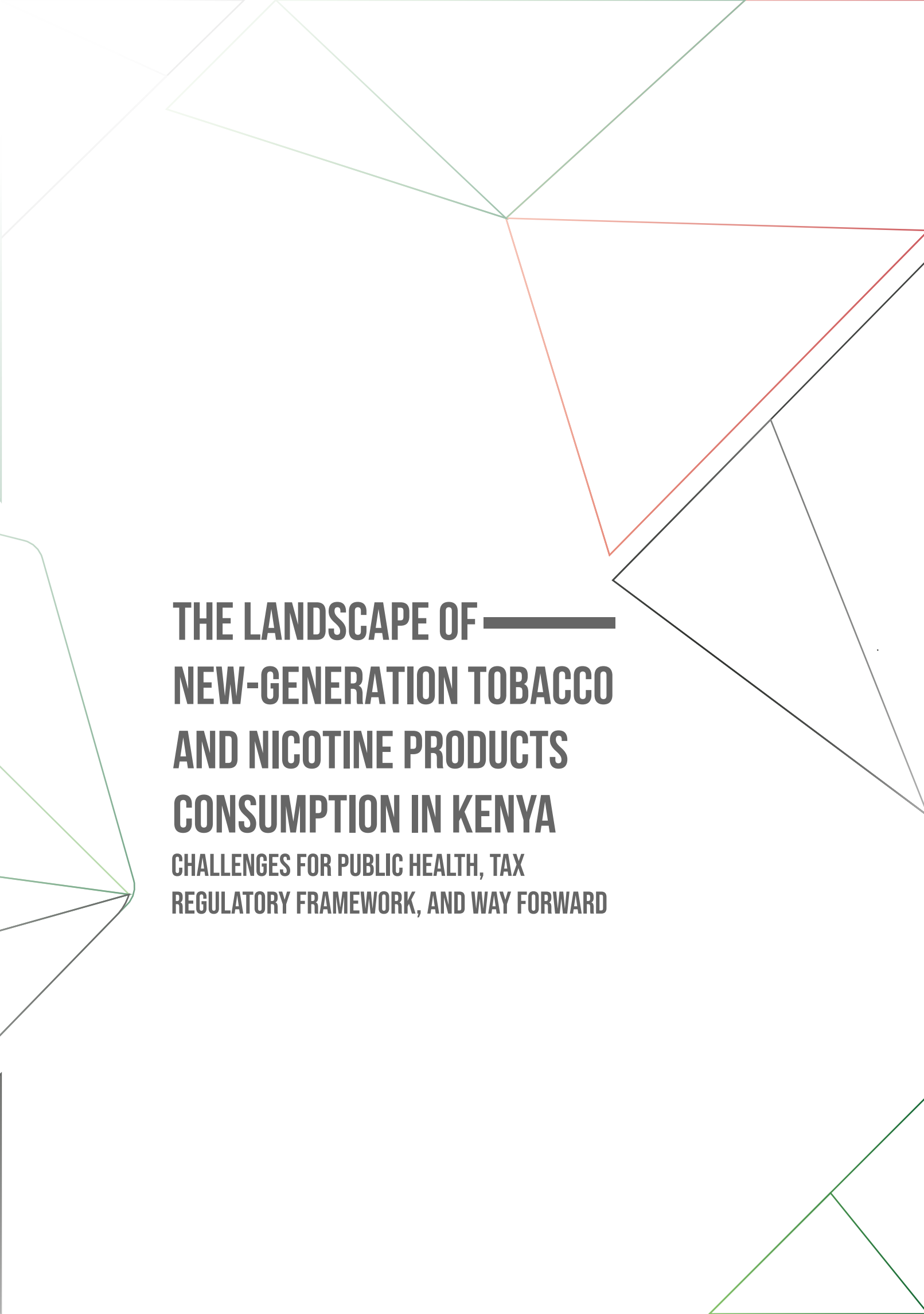
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ABSTRACT

This paper presents the Electronic Nicotine Delivery Systems and Electronic Non-Nicotine Delivery Systems (ENDS/ENNDS) consumption patterns in Kenya. The paper also highlights public health challenges associated with the consumption of these products and policy gaps in controlling consumption. Lastly, the paper proposes a way forward to avert the consumption of ENDS/ENNDS . Data was obtained from the 2022 Statista Consumer Insights Survey (n=2,837). In addition, we conducted semi-structured interviews with key informants working in the tobacco control policy (TCP) space (n=20), users of ENDS/ENNDS (n=224), community leaders (n=10), academia (n=10), parents of users (n=10), ENDS/ENNDS and tobacco industry representatives (n=20), policymakers from the Ministry of Health (MoH) and Law enforcement (n=20) to validate estimated prevalence levels and generate knowledge for policy reforms. The verified estimates show that the prevalence of ENDS/ENNDS was 5.6 (95% CI= 5.4% to 5.9%). From the findings, it was noted that ENDS/ENNDS consumption was the highest among those living in resourced areas versus those living in less-resourced areas. Males consume more ENDS/ENNDS than females. Co-use of illicit cigarettes, Cannabis and ENDS/ENNDS is more common in less-resourced regions than resourced regions. ENDS/ENNDS are traded illicitly in Kenya and there is inconclusive evidence linking ENDS/ENNDS consumption to successful cigarette cessation. Current tax regulatory frameworks are ineffective in averting ENDS/ENNDS consumption. Increased nicotine addictions and hypertension are the most reported side effects associated with ENDS/ENNDS consumption. There is a need to reform Kenya's Tobacco Control Act to address the criminality and rising ENDS/ENNDS consumption.

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SUMMARY BOX

What is already known?

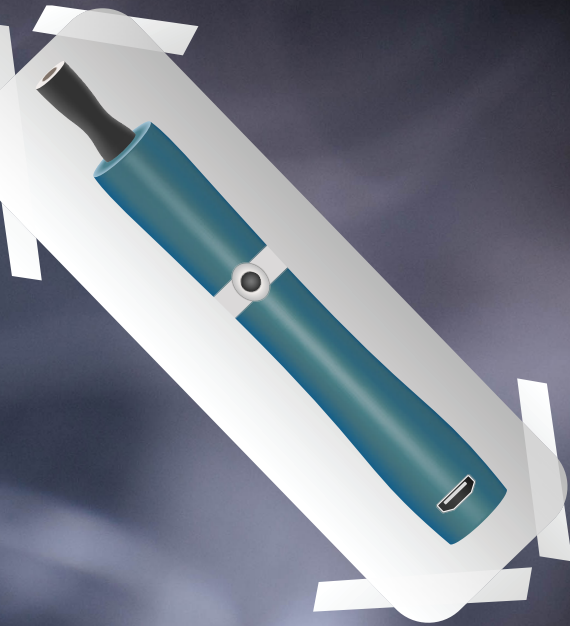
- ENDS/ENNDS consumption is increasing in high-income countries. However, the consumption patterns from developing countries are scarce.
- Recent studies have suggested that the ENDS/ENNDS market may undermine tobacco control policies.
- However, other studies argue that these products are effective in promoting smoking cessation.
- We collected data on ENDS/ENNDS consumption in Kenya.

What are the new findings?

- ENDS/ENNDS consumption in Kenya varied widely along five characteristics: age, education, gender, race and region.
- Those from well-resourced backgrounds drive consumption.
- The current regulatory framework is ineffective in averting ENDS/ENNDS consumption.
- ENDS/ENNDS are traded illicitly, and there is inconclusive evidence that ENDS/ENNDS drives smoking cessation.

What do the new findings imply?

- ENDS/ENNDS may deepen nicotine addiction levels in Kenya.
- Policymakers may want to prioritize culturally sensitive and gender messaging to prevent ENDS/ENNDS consumption in the vulnerable population groups.
- High taxation of ENDS/ENNDS is needed to avert consumption.



INTRODUCTION

The new-generation tobacco and nicotine products also known as Electronic Nicotine Delivery Systems and Electronic Non-Nicotine Delivery Systems (ENDS/ENNDS) are devices that heat and aerosolize nicotine liquids or tobacco products [1]. These devices generate vapor, which the user inhales, and uptake of these products has been increasing, especially in the youth population groups, since they were launched in the global markets in 2006 [2].

Currently, the consumption of ENDS/ENNDS is increasing globally [3]. For example, the global market for ENDS/ENNDS reached a value of US\$11.5 billion in 2018 and gained US\$26.84 billion in 2023 [4]. This increasing consumption level provides grounds for concern, especially if one considers the evidence that links ENDS/ENNDS to rising addiction levels and in young population groups [5] [6].

So far, papers that have mapped out the consumption patterns of ENDS/ENNDS and its impact on health outcomes of African countries are scarce [7]. The recent global review article only reported evidence from Ghana and Tunisia [8]—a sign of a significant lack of such analysis in various African countries, even though the continent has four million consumers of ENDS/ENNDS products[9].

One of the major reasons for the lack of ENDS/ENNDS consumption analysis and its impact on health outcomes, is the fact that the industry has promoted these products as effective for smoking cessation, a narrative well embraced by many countries [10]. This has caused confusion and limited the scrutiny of these products on African countries' public health outcomes. However, other countries have rejected the claims that ENDS/ENNDS consumption is harmless and have imposed restrictive policy measures [11] as recommended by the World Health Organization [12].

**\$11.5
BILLION**

the global market
value for ENDS/
ENNDS in 2018



**\$26.84
BILLION**

the global market
value for ENDS/
ENNDS in 2023

In such cases—governments are often worried about minimizing the number of new users of ENDS/ENNDS who become addicted to nicotine. Most of these countries enact restrictive regulations such as higher taxes on ENDS/ENNDS to reduce consumption demand, especially among non-smokers and youth [13]. The general position is that ENDS/ENNDS are harmful and serve to normalize smoking culture [14]. These products are a gateway to nicotine addiction, which spills over, causing harmful cigarette consumption for non-smokers and youth [15] [16].

Instead of supporting smoking cessation, ENDS/ENNDS encourage continued use of conventional cigarettes, resulting in the dual use of both products, consequently undermining smoking cessation [15] [16] [17]. So far, these consumption realities have not been established in Africa, and there is a heated debate with other authors claiming that these products are effective in assisting smokers to quit smoking [18]. Such a gap and ideological contestation calls for more assessment to be conducted in the continent to improve public health policy reforms of these products.

Policy framework for ENDS/ENNDS in Kenya

Kenya is among the 39 countries globally that have enacted excise taxes on ENDS/ENNDS [19] in an attempt to reduce the consumption. In 2017, the Kenyan government also imposed a total ban on Shisha/Hookah [20] -- a move which was designed to prevent the public health harms associated with Shisha consumption [21]. In 2019, Kenya also banned the consumption of Lyft—a nicotine pouch [22]. In 2020, the Kenyan government set the excise tax on e-cigarette liquids at Ksh 70/mg (\$ 0.4 USD/mg). The government also imposed a tax of Ksh 1595/kg (\$ 10 USD/kg) [23] on nicotine pouches.

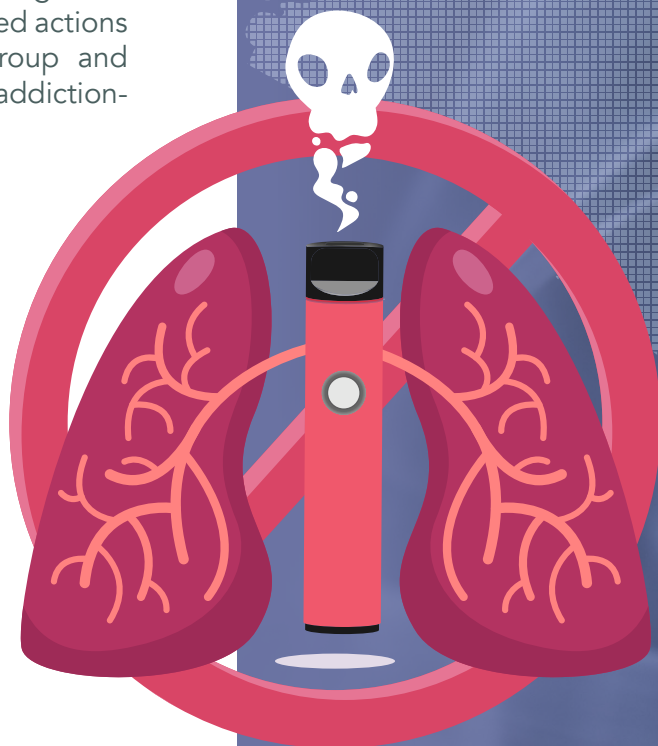
Despite these regulatory developments, no study in Kenya has analyzed the ENDS/ENNDS consumption trends, their impacts on public health, and whether the 2017- 2020 regulatory framework controls consumption levels effectively.



This paper is designed to estimate the consumption patterns of ENDS/ENNDS in Kenya by analyzing the 2022 Statista Consumer Insights Survey. We also estimate the percentage distribution of users according to the product of choice/brand loyalty. We also utilized semi-structured interviews of key informants to validate estimated consumption patterns and generate knowledge for policy reforms. This data enabled us to capture the differences in ENDS/ENNDS consumption in both resourced and under-resourced regions. Such knowledge is rare in Kenya, especially after the bans imposed by the government in 2017 and 2019, which might have prompted some users to source illicit products. In this paper, we sought to answer the following questions:

- i. Are there any differences in ENDS/ENNDS consumption between resourced and less-resourced regions?
- ii. Which population groups use ENDS/ENNDS the most?
- iii. Is there any evidence of illicit ENDS/ENNDS consumption?
- iv. Are users of ENDS/ENNDS having high appetite for quitting smoking?
- v. What practical steps can be adopted to reform the policy framework of ENDS/ENNDS to avert consumption effectively?

Answering these interrelated questions is critical in promoting the understanding of how ENDS/ENNDS consumption differs across various population groups and potentially undermines tobacco control policies. The study's findings also inform priority and, perhaps, more targeted actions for the most vulnerable population group and hence contribute to efforts to address addiction-related inequities.





2,837
completed the
survey

METHODS

Data sources

We used the 2022 Statista Consumer Insights Survey for our study. This online survey systematically monitors ENDS/ENNDS consumption in Kenya [24]. The datasets include adults who consume various ENDS/ENNDS products. Sampling can be stratified according to the region's economic status. The survey was designed to generate comparable ENDS/ENNDS consumption levels across Kenyan urban cities and small, under-resourced towns.

Measures

The surveys were completed by consenting participants aged 18 years and older who were daily or non-daily users of ENDS/ENNDS. A total of 2,837 completed the survey capturing individual characteristics (age, gender, education level, and self-identified race group). Based on regional GDP per capita higher than 4,500 USD, we categorized those individuals living in Nairobi County, Kiambu County, Nakuru County, and Mombasa County as residents of resourced regions. At the same time, we considered those in Kisumu County, Nyeri County, Kakamega County, Meru County, and other disadvantaged counties as users living in the 'less-resourced' region. This distinction was made because area-level socioeconomic status could encourage ENDS/ENNDS consumption. For example, household inequality has been declining in Kenya since 2015 regardless of the education level of the household head [25]. This factor is likely to influence the consumption patterns of ENDS/ENNDS.

During the 2022 Statista Consumer Insights Survey data collection, information on ENDS/ENNDS consumption was established by asking the participants who had indicated they consume these products --the following question: 'Overall, which ENDS/ENNDS do you consume?' The response options were (1) None, (2) ENDS, (3) ENNDS (4) Both ENDS and ENNDS. All respondents who did not indicate consuming any ENDS/ENNDS were coded as 0, and those who consumed ENDS/ENNDS, irrespective of the proportion or type, were coded as 1. We used

this binary variable to estimate the overall prevalence of ENDS/ENNDS consumption in Kenya, focusing on resource- and less-resourced settings. Details of the questionnaire are provided in the Appendix section.

In line with a recent publication on tobacco control policies in Africa [26], we also conducted semi-structured interviews with key officials (n=20) working in tobacco control policy (TCP) and possessing high levels of access to exclusive information on tobacco and substance abuse in Kenya. We also interviewed users of ENDS/ENNDS (n=224) in addition to the data generated by the 2022 Statista Consumer Insights Survey. We also interviewed community leaders (n=10), academia (n=10), parents of users (n=10), vaping and tobacco industry representatives (n=20), and policymakers from the Ministry of Health and Law Enforcement (n=20) to validate estimated consumption patterns and generate knowledge for policy reforms. During those interview processes, we presented the descriptive statistics of the 2022 Statista Consumer Insights Survey for optimization and validation.

We also conducted our independent online survey on ENDS/ENNDS consumption in Kenya. We carried out a cross-sectional online survey between Sept 2023 and March 2024. The participants were Kenyans who frequently visited clubs and entertainment areas weekly. The questionnaire included questions on E-cigarette, Shisha, and Nicotine pouches consumption. The survey aimed to estimate the percentage distribution of users according to the product of choice. We established the distribution breakdown by asking the participants who indicated they consume these products. The following question is: 'Overall, which of the new generation of tobacco and nicotine products do you consume the most? The response options were (1) E-cigarettes, (2) Nicotine Pouches, (3) Shisha/ Hookah (4) Refuse to Tell. Respondents who did not indicate consuming any E-cigarettes, Nicotine Pouches, and Shisha/ Hookah were coded

as 0, and those who consumed E-cigarettes, Nicotine Pouches, and Shisha/ Hookah were coded as 1. We used this variable to estimate the percentage distribution of users according to the product line, focusing on resource- and less-resourced settings. Details of the questionnaire are provided in the Appendix section.

We also use datasets from the key informants to establish the policy reforms to support consumption declines. Qualitative data was transcribed verbatim and thematically analyzed, as highlighted in the attached supplementary file.

We then compared the mean differences in ENDS/ENNDS consumption patterns in the resourced and less-resourced regions. The Chi-square test was utilized to test group differences for such estimations. We also apply the smoothing effects on our confidence interval points to control illogical deviations to mean estimates due to the under-reporting behavior of ENDS/ENNDS users.

In our case, we assume the probability of under-reporting ENDS/ENNDS consumption is high in Kenya. For example- users may shy away from genuinely expressing their consumption level –especially following the ban for some ENDS/ENNDS like Shisha and Lyft, which may trigger an increase in illicit consumption of these products. Hence, we opted for a five-percentage point upward adjustment from the reported prevalence as the most extreme point estimate.

The mainstream literature validates these under-reporting adjustments. For example, scholars in Vietnam employ various levels of under-reporting (10.0%- 30.0%) to conduct a sensitivity analysis for illicit estimates [27]. One study in South Africa assumes 5% under-reporting [28]. We believe that the five-percentage point upward adjustment is relevant for the Kenya settings. Policymakers, users, and other key informants accepted this correction factor.



RESULTS

The results show that ENDS/ENNDS prevalence (Table 1) is higher in the resourced setting than in the less resourced setting (7.9 % vs 3.4 %). The prevalence of ENDS/ENNDS consumption is high in individuals who self-identified as Asian and other races compared to the users who self-identified as African. The cohorts between 26 and 35 years have the highest prevalence of ENDS/ENDS consumption (10.5 % in resourced regions and 5.3% in less-resourced regions), and males have a higher prevalence of ENDS/ENDS consumption than females. Individuals with more than high school qualifications drive the consumption of ENDS/ENNDS products in Kenya in both resourced and less-resourced regions (See Table 1).

Table 2 reports the percentage distribution of ENDS/ENNDS users in Kenya. About 55.1 % of users in the less-resourced regions consume illicit Shisha despite the government's 2017 ban. About 50.5 % of users in the resourced regions consume ENDS/ENNDS products daily. Co-use of illicit cigarettes, Cannabis, and ENDS/ENNDS products is more common in users from less-resourced regions than resourced regions. Most users (70.1 % in resourced regions and 81.1% in less-resourced regions) have not attempted quitting smoking, and addictions are highly reported in both regions (See Table 2).

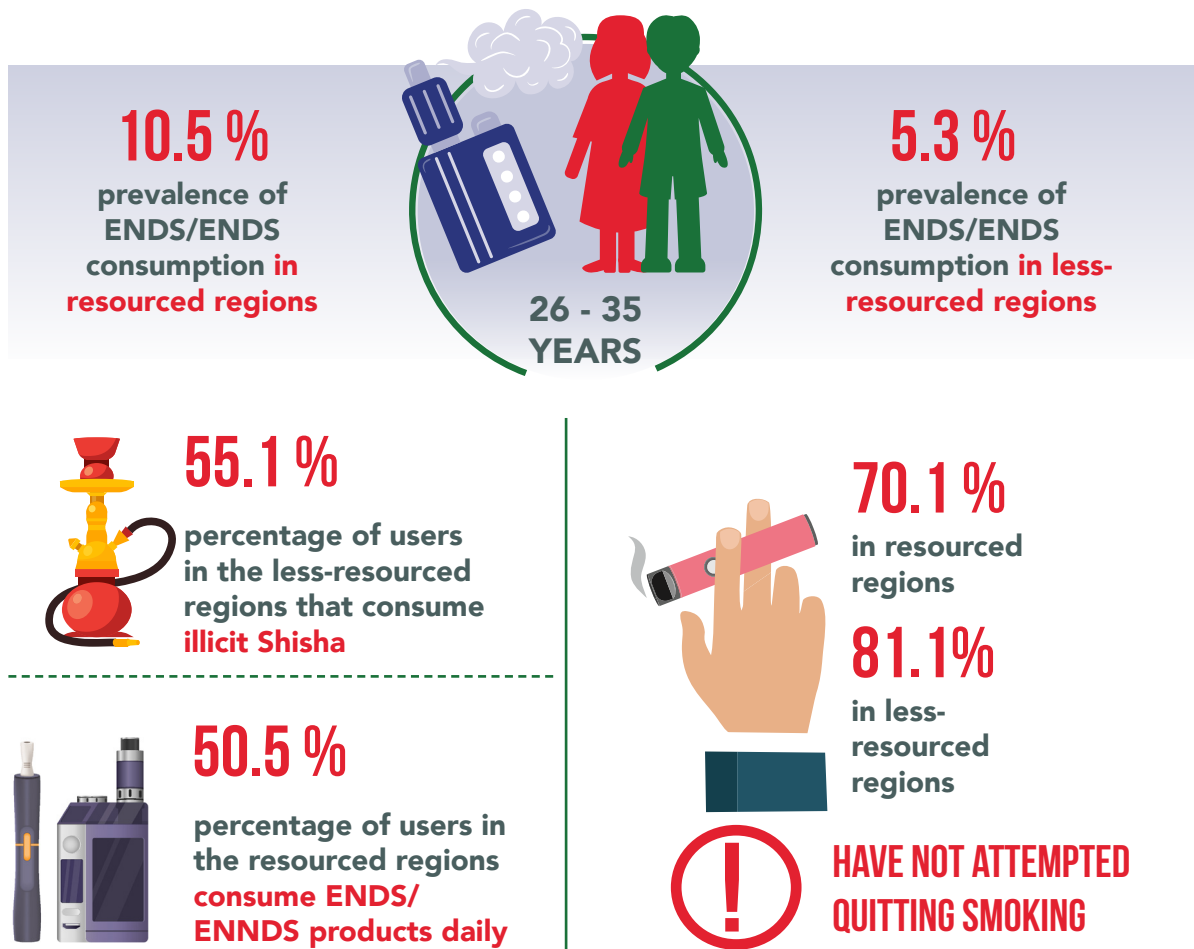


Table 1. 2022 Statista Consumer Insights Survey Estimates of ENDS/ENNDS consumption.

	Prevalence of ENDS/ENNDS Consumption	Prevalence of ENDS/ENNDS Consumption	% difference	***denote Chi-Square Test p-values <0.05
	Resourced regions	Less-resourced regions		
Region	7.9 (7.7 to 8.2)	3.4 (3.5 to 3.9)	-56.9	***
Overall		5.6 (5.4 to 5.9)		
Race				
African	6.1 (5.9 to 6.4)	2.1 (1.8 to 2.2)	-65.6	***
Asians and other races	9.7 (9.5 to 10.2)	5.4 (18.4 to 25.6)	-44.3	***
Age				
18-25	5.9 (5.7 to 6.2)	2.2 (2.0 to 2.3)	-62.7	***
26-35	10.5 (10.3 to 11.1)	5.3 (5.1 to 5.6)	-27.4	***
> 36	7.3 (7.1 to 7.7)	2.8 (3.2 to 2.9)	-73.3	***
Gender				
Male	11.2 (11.0 to 11.8)	4.6 (4.4 to 4.8)	-58.9	***
Female	4.6 (4.4 to 4.8)	2.3 (2.1 to 2.4)	-50.1	***
Education				
<High School	3.9 (3.7 to 4.1)	2.2 (2.0 to 2.3)	-43.5	***
High School	8.3 (8.1 to 8.7)	3.2(3.0 to 3.4)	-61.4	***
>High School	11.5 (11.3 to 12.1)	4.8(4.6 to 5.1)	-58.3	***
Total Sample	1227	870		
Note: Chi-Square p-value compare changes in ENDS/ENNDS consumption. Resourced vs Less-resourced regions.				



Table 2. Survey estimating percentage distribution of ENDS/ENNDS users.

	% Distribution of ENDS/ ENNDS users	%Distribution of ENDS/ ENNDS users	% difference	***denote Chi-Square Test p-values <0.05
	Resourced regions	Less-resourced regions		
Type of ENDS/ENNDS				
E-Cigarettes	38.0	20.0	-47.3	***
Nicotine Pouches	31.1	25.2	-19.3	***
Shisha/Hookah	31.0	55.1	77.4	***
Consumption intensity				
Daily	50.5	45.5	-10.0	***
Weekly	34.5	34.4	-1.1	
Monthly	10.4	15.0	44.2	***
Occasionally	5.1	5.2	2.0	
Co-use				
Illicit tobacco	28.1	35.1	25.0	***
Cannabis	34.4	42.0	22.1	***
Legal cigarettes	38.1	23.2	-39.1	***
Smoking Cessation				
Attempted quitting 3months ago	10.0	11.1	11	
Attempted quitting 6months ago	20.1	8.2	-59.2	***
Not Attempted	70.1	81.1	15.7	***
Side Effects				
Addiction	60.1	51.4	-16.1	***
Hypertension	30.1	39.6	35.0	***
Declining brain function	10.0	9.0	10.0	
Total Sample	123	101		
Note: Chi-Square p-value comparing ENDS/ENNDS percentage distribution. Resourced vs Less- resourced regions.				

DISCUSSION

This study explored the difference in ENDS/ENNDS consumption in Kenya's resourced and less-resourced regions. Our estimations showed a significantly higher prevalence of ENDS/ENNDS consumption in the resourced regions than in the less-resourced regions (Table 1). Male users who self-identified as Asians and other races, between the ages of 26 and 35, with education above high school consume the bulk of ENDS/ENNDS (Table 1). These results are consistent with findings from global studies, which suggested that the young generation of males are the primary consumers of ENDS/ENNDS [29].

The Shisha ban in Kenya might have contributed to the increased illicit Shisha consumption. However, the current estimation does not support the claims that illicit Shisha consumption was 16.5%, as presented in 2023 [20]. This paper only focused on Nairobi and excluded other cities and small towns in Kenya, hence the conservative illicit Shisha estimations. We documented that 30% of users still consume Shisha in resourced regions. We also discovered that illicit consumption is often higher in less-resourced settings than in resourced regions. This evidence is documented in South Africa [30] and explains the 55 % of users of Shisha recorded from less-resourced regions (See Table 2). Therefore, the illicit Shisha estimates generated by the Nairobi study potentially show downward biases.

Kenyan Revenue Authority set the tax on e-cigarette liquids at Khs 70/mg (\$ 0.4 USD/mg) in 2020[23]. Therefore, the tax per 50mg should be Khs 3500 (\$ 22 USD). So far, there are no 50mg e-cigarette liquids in the Kenya market that are trading above Ksh 3000 (\$ 19 USD). Such low prices reflect a thriving illicit network, considering liquid vapes cannot trade below the tax value.

Hence, majority users have reported increasing addiction levels and hypertension cases (Table 2) associated with ENDS/ENNDS consumption. In the literature – there is evidence that ENDS/ENNDS consumption causes higher addiction levels and increases blood pressure and heart rate [31] & [32]. JUUL– a trendy brand in Kenya, is known to release more nicotine in the first puffs compared to other products in the markets [33]. These nicotine levels explain the high addiction levels reported in our study (Table 2).

Therefore, the industry view that ENDS/ENNDS are less risky (See supplementary file: Item 6- Industry marketing strategy) and support smoking cessation needs to be re-examined [34]. Table 2 shows that the majority of users are not attempting to quit smoking. Therefore, tighter regulations are warranted to control consumption levels. International authors have also raised doubts about the industry narrative that these products support cessation and called for more investigation [35].

The higher illicit consumption of Shisha, Cannabis, and illicit cigarettes, especially among those living in low-resourced settings, is worrying - primarily when focusing on the already existing higher levels of poverty, unemployment, and lower access to health care. Such consumption patterns may worsen addictions-related inequalities and blunt the efforts of tobacco control policies, considering the high affordability of these products. Other authors argue that ENDS/ENNDS is the new gateway to cigarette smoking and other products and needs to be controlled stringently [15][16][17].

Therefore, addressing the criminality associated with the illicit trading of ENDS/ENNDS, Cannabis, and cigarettes through law enforcement should be prioritized.

The government must continue to pursue evidence-based tobacco control policies, including increasing excise taxes, which have been associated with reduced consumption of ENDS/ENNDS [36]. The current ENDS/ENNDS tax regime in Kenya is not practical in reducing consumption (See supplementary file: Item 9- Regulatory frameworks for NGP), considering that most users are well-off, educated individuals (See Table 1) who can afford these products easily. For example, the trading price of 10mg of nicotine pouches is Ksh 350 (\$ USD 2.2) (See supplementary file: Item 12 Economics of NGP). The tax on nicotine pouches is Ksh 1595/kg (1.595/g). Therefore, the tax per 10mg is Ksh 2 cents. This figure needs to be higher to make a meaningful contribution to reducing consumption. Even school-going children can afford these products. The government may want to impose a special excise tax on nicotine pouches to avert consumption.

The industry view that higher taxation will worsen illicit consumption is incorrect [37] (See supplementary file: Item 19- Industry attitudes towards NGP). For example, the illicit Shisha trade intensified in 2023 when the excise tax rate was much lower—considering the government’s tax break [38]. Therefore, the industry’s view that higher taxes drive high illicit proliferation must be rejected. There is still fiscal space for aggressive taxation of ENDS/ENNDS to avert the high addiction levels (See supplementary file: Item 20- Policy maker’s attitudes towards NGP).

Limitations of the study

As with any other study, this study has some limitations. For example, our surveys probed potential stigmatizing information such as the frequency of using ENDS/ENNDS and reporting the purchase of illicit products. There is an existing possibility that the data does not reflect the total evolution of ENDS/ENNDS in Kenya. A minority of users with missing data (<2.0%) were perhaps uncomfortable disclosing information. Nevertheless, this aspect will not significantly influence the current results since the majority responded comprehensively to our questions, and we were able to apply appropriate validation techniques from policymakers and critical

informants working in the tobacco control space.

Despite these limitations, this study represents the first paper that we are aware of that maps out the consumption patterns of ENDS/ENNDS in Kenya using the population survey approach mixed with interviewing policymakers, users, parents of users, industry representatives, community leaders, and scholars to generate consensus for policy reform and validate the estimated consumption patterns. Such an approach may be relevant to other African countries where it is more challenging to get accurate consumption patterns due to limited capacities within the tobacco control space.

Policy implications

Confronting the growing illicit ENDS/ENNDS consumption requires a greater political will to increase investment in tax administration, including developing greater capacity for law enforcement and deploying appropriate technology-supported strategy. These measures have been used successfully in Montenegro, where the illicit cigarette market share decreased from 51.0% to 22.0% over three years [39]. The opportunities for success are greater when policymakers are prepared to take bold actions. Kenya can do better by taxing ENDS/ENNDS higher and coordinating intelligent operations to unsettle the entire supply chain of the illicit network (from the factory where the products are manufactured to the final stage of the illegal trade). These measures should be combined with targeting cessation support and awareness campaigns focusing on the vulnerable population groups with high consumption prevalence. The solatium funds collected from the industry can be utilized for these health promotion activities. There is also a need to capacitate the local county governments to monitor the consumption levels of these products in their regions. Policy makers from national government must also bridge the gap between national and county officials in policy formulation to address the growing ENDS/ENNDS consumption. Regular meetings between the two spheres of government are needed to monitor the evolving consumption trends.

CONCLUSION

The landscape of ENDS/ENNDS in Kenya is dominated by illicit products. Capacitating tax authority to root out illicit products is critical. Such action, together with targeted cessation support and awareness public health campaigns, will go a long way in strengthening the resilience of tobacco control policies in averting ENDS/ENNDS consumption.

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Author contributions: CM was responsible for the conception and design of the study. CM was also responsible for analysis, interpretation and drafting of the initial work. CM, AA, LK, WN, RM, IO, JS, AJS, KM, CM, ZM, GG, JT and LA revised and approved the final manuscript.

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Conflicts of interest: None.



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APPENDIX

Survey 1

2022 Statista Consumer Insights Survey

1. **Name of the region/town:**
2. **Age of participant in years:**
3. **Gender of participant:** 1 = Female, 2 = Male
4. **Residence of the participant:** 1 = Rural, 2 = Urban
5. **Race :** 1 = Black, 2 = Asian and other
6. **Education level:** 1 = less than high school, 2 = Completed high school, 3= Having tertiary qualification
7. **Consume ENDS/ENNDS :** 1=Yes, 2= No

Survey 2

Consumption Survey Questionnaire

1. **Name of the region/town:**
2. **Age of participant in years:**
3. **Gender of participant:** 1 = Female, 2 = Male
4. **Residence of the participant:** 1 = Rural, 2 = Urban
5. **Race:** 1 = Black, 2 = Asian and other
6. **Education level:** 1 = less than high school, 2 = Completed high school, 3= Having tertiary qualification
7. **Type of new generation product consumed:** 1= E-cigarettes , 2=Shisha, 3=Nicotine Pouche, 4=Refuse to tell.
8. **Preferred brand:** 1=Dunhill Switch Flavours, 2=Electricity cigarettes, 3=Gold Puff, 4=SoloX, 5=Elfbar, 6=Iqos, 7=Juil, 8=Ketepa tea, 9=Khaleej shisha flavour, 10=KK energy, 11=Dry weed vaporizers, 12=Nicorette, 13=Smoke and Twisp, 14=Tugboat, 15=Vbar, 16=eGo-T Vape Pen, 17=Lyft, 18=Velo
9. **Consumption intensity of ENDS/ENNDS products:** 1 = Daily, 2 = Weekly, 3= Monthly, 4= Occasionally
10. **Co-use:** 1 = Cheap illicit cigarrates , 2 = Cannabis , 3= Legal cigarrates, 4= None.
11. **Side effects:** 1 = Addiction , 2 = Hypertension, 3 = Declining brain function, 4= Other 5= None.
12. **Smoking Cessation:** 1 = Attempted quitting 3 months ago, 2 = Attempted quitting 6 months ago , 3= Not attempted

Survey 3

Interview questions administered to the Key informants

1. Position of the Key informant :
2. What is the consumption trend of ENDS/ENNDS in the past 5 years :
3. What are the consumption hotspots of ENDS/ENNDS in Kenya :
4. Supply chain of ENDS/ENNDS in Kenya:
5. Cohorts consuming ENDS/ENNDS:
6. Industry marketing strategy:
7. Myth about ENDS/ENNDS discovered in the community:
8. Drivers of ENDS/ENNDS consumption:
9. What are existing regulatory framework for ENDS/ENNDS:
10. Can you elaborate on existing programs to avert ENDS/ENNDS consumption:
11. Side effects associated with ENDS/ENNDS consumption:
12. Average price for ENDS/ENNDS products:
13. Tax share derived from the trading price:
14. Prices for tobacco products which are co-used with ENDS/ENNDS:
15. Consumption intensity of ENDS/ENNDS:
16. Consumption intensity for tobacco products which are co-used with ENDS/ENNDS:
17. Origin of ENDS/ENNDS products consumed in Kenya:
18. Any existing bans from producing regions:
20. Minimum spending on ENDS/ENNDS / month for beginners:
21. Views from the industry regarding ENDS/ENNDS regulations:
22. Views from policy makers regarding ENDS/ENNDS regulation:
23. Views from users regarding ENDS/ENNDS regulation:
24. Views from parents of users regarding ENDS/ENNDS regulation:
30. Views from scholars regarding ENDS/ENNDS regulation:
31. Policy recommendation



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