Understanding the health risks of e-cigarettes: A rapid review to inform UCT's investment decisions.

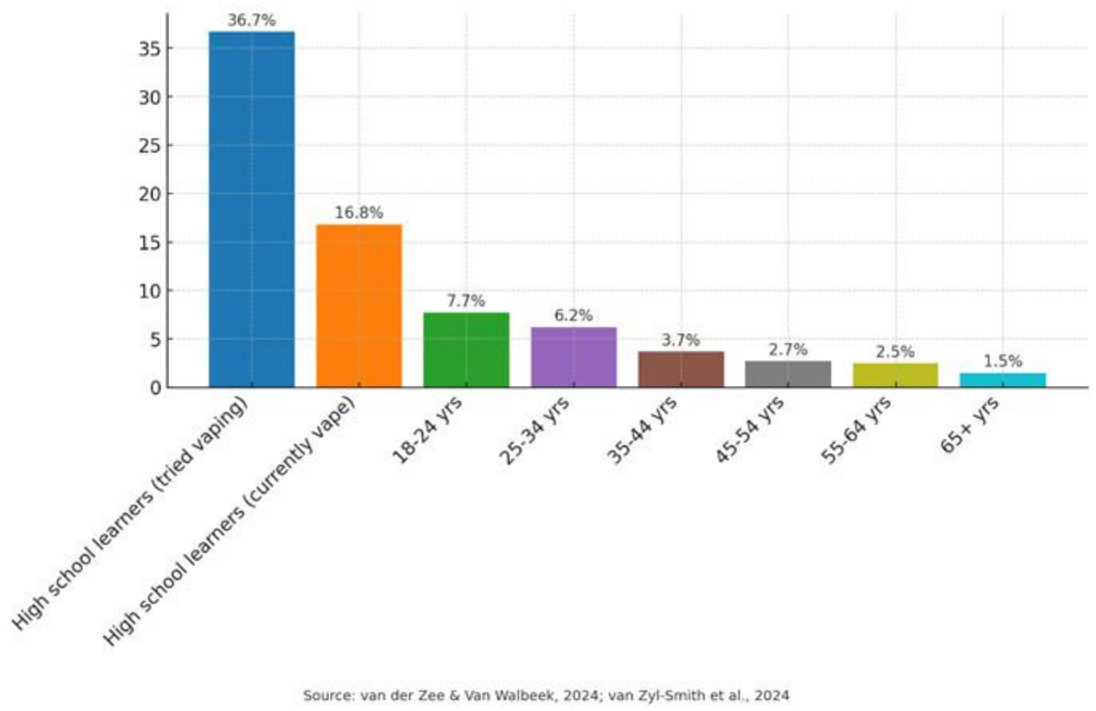
Matlholwa CM[1]*, Vellios N[2], London L[1]

1School of Public Health, Faculty of Health Sciences, University of Cape Town, Western Cape, South Africa
2Research Unit on the Economics of Excisable Products, University of Cape Town, Western Cape, South Africa
*cmatlholwa@gmail.com

Introduction

Electronic Nicotine Delivery Systems (ENDS), or e-cigarettes, are battery-powered devices that deliver nicotine aerosols. Despite claims that e-cigarettes help people quit smoking cigarettes, the long-term health effects of e-cigarettes remain unclear. This review, conducted within an MPH Practicum project, synthesizes evidence on ENDS prevalence and health risks in South Africa (SA) and abroad to inform a policy brief for UCT's Panel on Responsible Investment.

Figure 1: ENDS use trends in South Africa



Methodology

A structured search was conducted to identify literature on the use of ENDS, health risks, and trends in SA and abroad. Peer-reviewed studies were identified using the terms "vapes", "e-cigarettes" and other related words in Google Scholar and PubMed. Industry-funded research was excluded. Trusted grey literature provided context. Data was extracted into Excel and analyzed thematically.

Results

- ENDS expose users to harmful chemicals, some are unique to aerosols.
- Adolescents ENDS users were more likely to be diagnosed with bronchitis, pneumonia or chronic cough (IRR = 1.49; 95% CI 1.06–2.08) and had 31% higher odds of asthma than non-users (pooled OR = 1.31; 95% CI 1.22–1.42).
- E-cigarette users have 33% higher odds of heart attack risk (95% CI 1.14–1.56) than non-users.
- ENDS use in pregnancy shows 88% higher risk of low birth weight (95% CI 1.38–2.57) and 69% higher preterm birth risk (95% CI 1.20–2.39) than non-users.
- In SA, 19% of never-smokers using ENDS began smoking, while 7% who used ENDS after smoking quit cigarettes.

Figure 2: Fagerström Test for Nicotine Dependence (FTND) scores across different user groups.

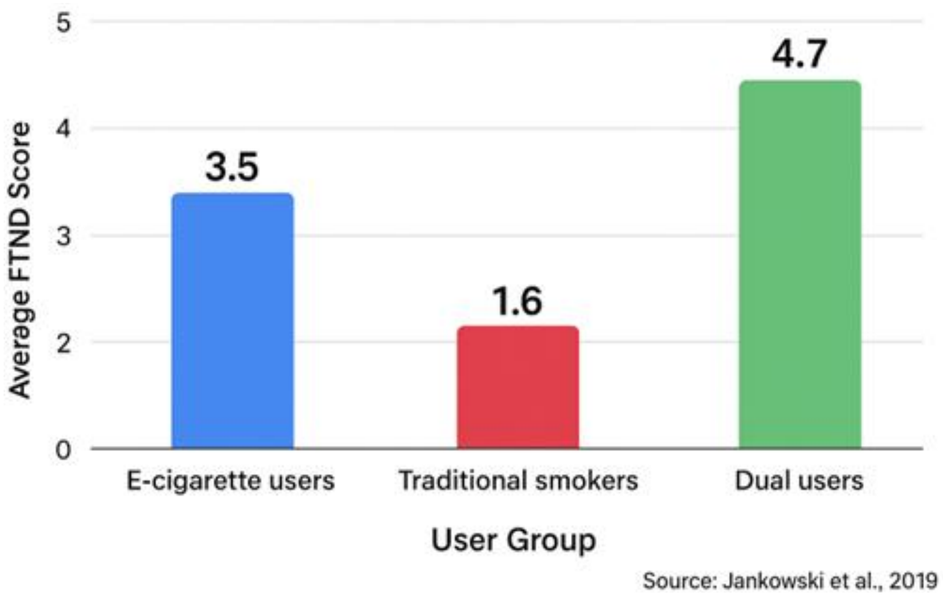
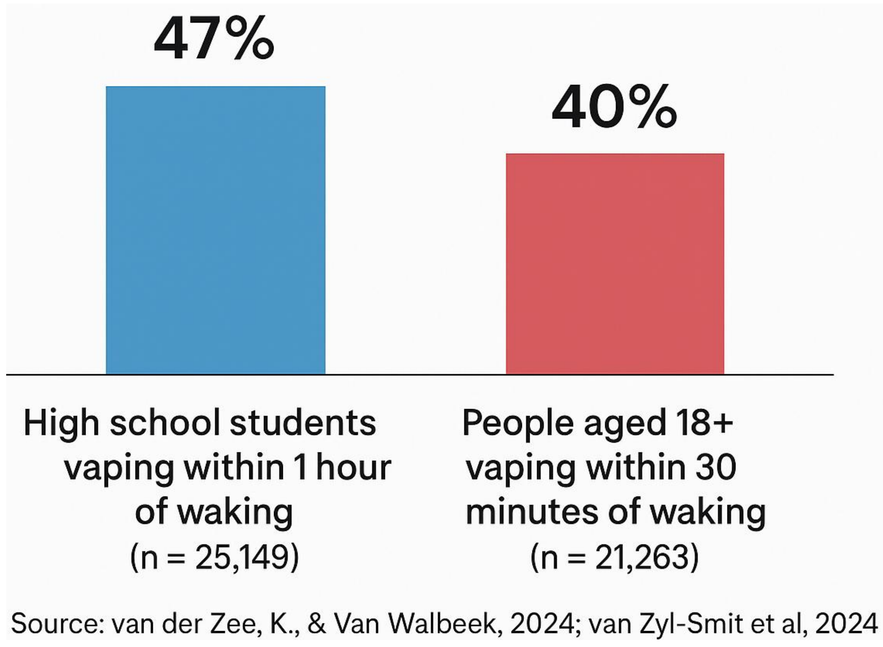


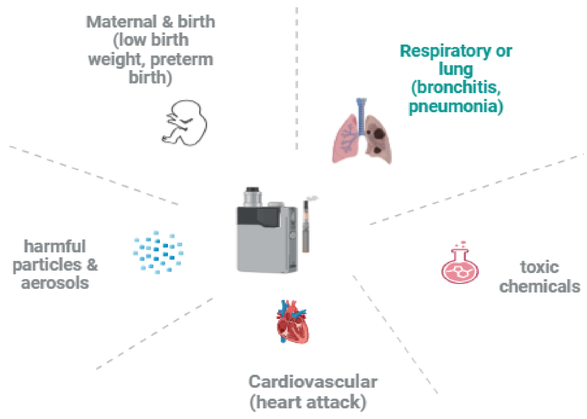
Figure 3: E-cigarette nicotine dependence



Discussion

- Evidence challenges claims of safety, highlighting health risks and sustained nicotine dependence over cessation.
- Youth uptake is rising.
- Tobacco companies long-term profitability remains uncertain.
- Regulatory measures to prevent harm and gateway transitions further threaten the long-term ENDS market success.
- The university is encouraged to strengthen ESG criteria for ENDS investments, particularly for manufacturers, due to the social, governance, and reputational risks these products pose.

Figure 4: ENDS related harms



References

Cancer Association of South Africa (CANSA). (2023, August 1). World Lung Cancer Day 2023 webinar: South African E-cigarette Survey 2022 results [Webinar]. https://cansa.org.za
Evans, T. (2022). Up in Smoke? Assessing the Economic Case for Investing In, or Divesting From, Tobacco Companies.
Evans, T., Sayed, A., & Van Walbeek, C. (2024). Evaluating the financial case for investing in, or divesting from, tobacco investments. Tobacco Control.
Mukerjee, R., Hirschtick, J. L., Arciniega, L. Z., Xie, Y., Barnes, G. D., Arenberg, D. A., Levy, D. T., Meza, R., Fleischer, N. L., & Cook, S. F. (2024). ENDS, cigarettes, and respiratory illness: longitudinal associations among US youth. American Journal of Preventive Medicine, 66(5), 789-796.
Tobacco Control Data Initiative. (2023). E-cigarette use in South Africa. South African E-Cigarette Survey 2022 https://southafrica.tobaccocontroldata.org/en/home/ecigarettes/
van der Zee, K., & Van Walbeek, C. (2024). Interactions between ENDS and cigarette use: evidence from a 2022 national telephone survey in South Africa. Tobacco Control.
van Huyssteen, T., & Borole, M. (2022). Trends in e-cigarette and heated tobacco product use in urban South Africa (Report). Cape Town, South Africa: Tobacco Control Data Initiative; REEP; Development Gateway. https://southafrica.tobaccocontroldata.org/wp/wp-content/uploads/TRENDS-IN-E-CIGARETE-CIG-AND-HEATED-TOBACCO-PRODUCT-USE-IN-URBAN-SOUTH-AFRICA-Final-Report_02.pdf
van Zyl-Smit, R. N., Filby, S., Soin, G., Hoare, J., van den Bosch, A., & Kurten, S. (2024). Electronic cigarette usage amongst high school students in South Africa: a mixed methods approach. EClinicalMedicine,
Vyncke, T., De Wolf, E., Hoeksema, H., Verbelen, J., De Coninck, P., Buncamper, M., Monstrey, S., & Claes, K. E. (2020). Injuries associated with electronic nicotine delivery systems: A systematic review. Journal of trauma and acute care surgery, 89(4), 783-791.