

# Global disparities in the regulation of electronic cigarettes

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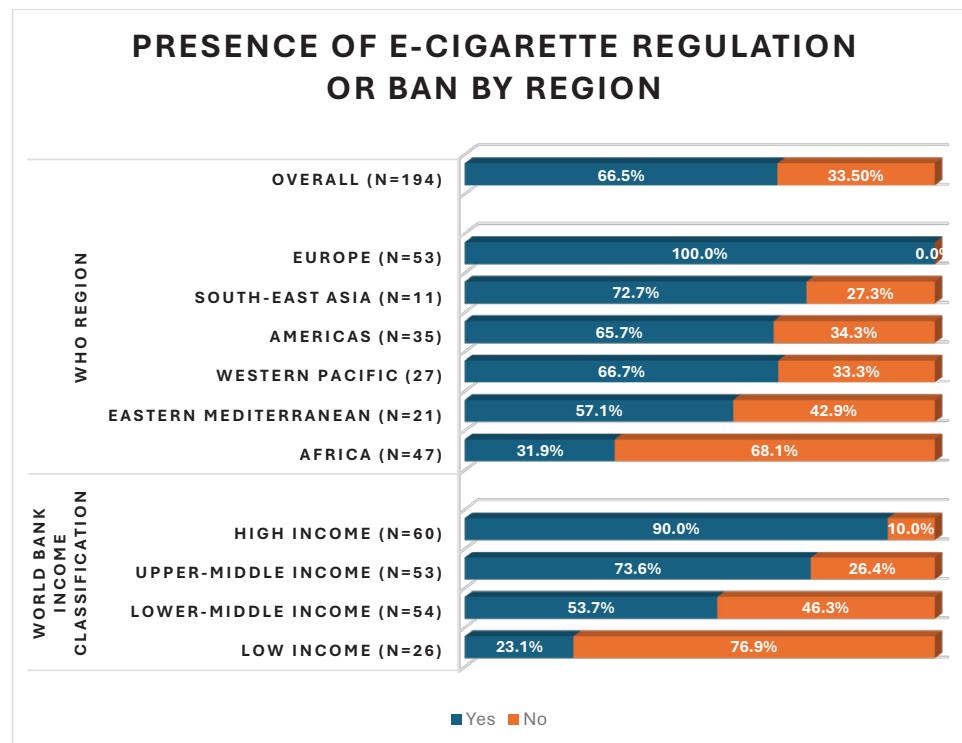
Dear Editor,

Authorities facing aggressive e-cigarette marketing to vulnerable populations<sup>1,2</sup> often fall back on legislations predating e-cigarettes<sup>3</sup> to regulate these products. We investigated disparities in e-cigarette regulations/bans for countries in the six WHO regions and four World Bank income groups.

Countries' regulations/bans on e-cigarettes were coded Yes (1) or No (0) for presence of a regulation/ban using the Institute of Global Tobacco Control, Johns Hopkins Bloomberg School of Public Health<sup>4</sup>, and Global Center for Good Governance in Tobacco Control websites<sup>5</sup>. For countries listed as 'unknown' on both websites, we checked government and other online sources for e-cigarette regulations. Countries' WHO region<sup>6</sup> and World Bank income group categories<sup>7</sup> were entered in a spreadsheet. Frequency distributions and chi-squared tests were conducted using SPSS v26. Independent bivariate logistic regression analyses used the WHO region and World Bank income group as predictor variables with significance at  $p<0.05$ .

Among 194 'countries' (193 WHO member states/entities and Niue), 66.5%

**Figure 1. Proportion of countries with or without electronic cigarette regulation or ban, categorized by WHO region and World Bank income classification**



Significant associations were found between the presence of e-cigarette regulations and WHO regions [ $\chi^2$  (N=194, df=5)=52.96,  $p<0.001$ ] and World Bank income classifications [ $\chi^2$  (N=193, df=3)=41.96,  $p<0.001$ ].

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have e-cigarette regulations/bans (Figure 1). All 53 countries in the WHO Europe region have regulations, 15/47 in the AFRO region, 8/11 in South-East Asia, 23/35 in the Americas, 18/27 in the Western Pacific, and 12/21 in the Eastern Mediterranean. Using the World Bank income grouping, 54/60 high income countries have regulations, 39/53 upper middle-income countries, but only 6/26 low-income countries (LICs), and 29/54 lower middle-income countries, have e-cigarette regulations/bans (Figure 1). Chi-squared test showed a significant association between having an e-cigarette regulation/ban and belonging to a WHO region/World Bank income group ( $p<0.001$ ).

Bivariate logistic regression showed countries outside Africa had significantly higher odds of having e-cigarette regulations: nearly six times in South-East Asia, four times in the Americas and Western Pacific, and three times (not significant) in the Eastern Mediterranean. WHO Europe was excluded, as all its countries have regulations. Further, compared to LICs, HICs had 30 times, upper middle-income nine times, and lower middle-income nearly four times higher odds of having e-cigarette legislation.

Since the market debut of e-cigarettes in 2004<sup>8</sup>, many LICs and lower middle-income countries do not yet have regulations. Lagging tobacco-control laws/regulations allow normalization of these products through unrestricted advertising, and targeted marketing.

Africa and LMICs (often overlapping WHO and World Bank categories) disproportionately lack e-cigarette regulation – reasons may include less political and economic stability, low public awareness, and high tobacco industry interference<sup>9</sup>. Some LMICs lack the political will and finances to oppose industry interference, but may benefit from regional cooperation.

All WHO Europe region countries have some form of e-cigarette regulation. The European Union (EU) regional bloc promotes vertical policy diffusion within countries, e.g. the Tobacco Products Directive (2014/40/EU) governs EU sales of e-cigarette as consumer products<sup>10</sup>, shaping national policies fostering harmonization and monitoring of tobacco and e-cigarette regulations across the EU<sup>10</sup>. The EU

example shows how regional blocs like the African Union, and the Association of Southeast Asian Nations (ASEAN) can work together cost-effectively to strengthen political will for stronger laws.

Regulatory frameworks, while crucial, may not always address underlying inequities effectively, therefore robust surveillance and effective policy implementation are needed.

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**CONFLICTS OF INTEREST**

The authors have each completed and submitted an ICMJE form for disclosure of potential conflicts of interest. The authors declare that they have no competing interests, financial or otherwise, related to the current work. C.O. Egbe reports that since the initial planning of the work this study was supported by the South African Medical Research Council (No payment was made: Writing time covered by salary), and that in the past 36 months grants were received from the Campaign for Tobacco-Free Kids to the South African Medical Research Council for a study on University Students' exposure to e-cigarette and hookah advertising in South Africa and Honorarium for BETA training workshop from the African Tobacco Industry Monitoring and Policy Research Institute (ATIM), University of Pretoria. In addition C.O. Egbe reports that in the past 36 months received support from the National Research Foundation for attending the KIC (Travel award) to attend SRNT 2024 conference and from the SRNT Global Research Network for attending the Travel scholarship to attend SRNT 2025 conference and that she participated in the South African Medical Research Council (Member of the DSMB on the study titled "Evaluating smoking cessation approaches among South Africans with HIV/AIDS: a pilot randomized control trial"), and that she held a leadership or fiduciary role in other board, society, committee or advocacy group, paid or unpaid, as she was Co-Chair, Global Research Network to the Society for Research on Nicotine and Tobacco and a Member of Advisory Board in the South African Tobacco-Free Youth Forum. S. Nyatsanza reports that since the initial planning of the work this manuscript was supported by the Campaign for Tobacco Free Kids (No payment made: Writing time covered by fee) and that in the past 36 months received consulting fees from the World Health Organization to support the review and drafting of amendments of the tobacco products control act of 2013 and the finalization of the tobacco products control regulations (Eswatini). O.F. Fagbule reports that in the past 36 months received from SRNT Global Research Network, a travel scholarship to attend SRNT 2024 Conference and reports that he was a Vice Chair, and Advisory Board at the African Tobacco Control Alliance (ATCA) and a member of the Advisory Board at the Nigerian Tobacco Control Alliance (NTCA).

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**ETHICAL APPROVAL AND INFORMED CONSENT**

Ethical approval and informed consent were not required for this study.

**DATA AVAILABILITY**

The data supporting this research can be found in the Supplementary file.

**AUTHORS' CONTRIBUTIONS**

COE: conceptualized the study. OFF: collected and analyzed the data. COE and OFF: interpreted the results. COE, OFF and SN: wrote the first draft. COE: critically reviewed the first and other drafts.. All authors read and approved the final version of the manuscript.

**PROVENANCE AND PEER REVIEW**

Not commissioned; internally peer reviewed.

**DISCLAIMER**

The views and opinions expressed in this article are those of the authors.