

India's environmental burden of tobacco use and its policy implications

Yogesh Kumar Jain,^{a,b} Pankaj Bhardwaj,^{a,b,*} Nitin Kumar Joshi,^b Prashant Kumar Singh,^c Pranay Lal,^d Shivam Kapoor,^d Manoj Kumar Gupta,^{a,b} Akhil Dhanesh Goel,^a Prem Prakash Sharma,^a and Shalini Singh^c

^aDepartment of Community Medicine and Family Medicine, All India Institute of Medical Sciences, Jodhpur, Rajasthan, India

^bSchool of Public Health, All India Institute of Medical Sciences, Jodhpur, Rajasthan, India

^cDivision of Preventive Oncology and Population Health, ICMR - National Institute of Cancer Prevention and Research, Noida, Uttar Pradesh, India

^dDepartment of Tobacco Control, International Union Against Tuberculosis and Lung Disease, Southeast Asia, New Delhi, India

The US Surgeon General's report of 1964 and the wealth of research that followed over the decades established the devastating health and economic impacts of tobacco on its users.^{1,2} However, the volume of the unaccounted tobacco products waste discharged into the environment gets very little attention.³ Because of its sheer volume and toxic nature it harms many marine and animal life forms and subsequently the humans, due to the contamination in the food chain and resulting biomagnification.³ South-east Asian region is home to 81% of the world's smokeless tobacco users and 22% of adult smokers,⁴ amongst which, India alone caters to over 270 million active tobacco users. While many western countries have taken steps to ensure disposal of nicotine and related chemicals as hazardous wastes, under their policies for environmental protection, no such provisions classify tobacco product wastes separate from the municipal solid wastes in India.² Existing WHO reports and published literature does indeed identify a major share of plastic, foil and filter waste related to cigarettes, bidis and smokeless tobacco products being disposed of into landfills and marine debris, contributing to discharge of microplastics, heavy metals and toxins,^{5,6} yet no previous attempts quantify such waste from a country specific perspective.

A countrywide cross-sectional study was conducted from January to April 2022, to assess the waste generated due to the tobacco products (cigarette, bidi and smokeless tobacco) sold in India. Segregated weighing of paper, plastic, foil and filter components was done from 222 brands of tobacco products gathered from 17 states of India. Subsequent data modelling using nationally representative Global Adult Tobacco Survey (2016–2017) data revealed a staggering 170,330.49 tonnes of waste contributed annually by cigarette, bidi and smokeless tobacco ([Supplementary](#)

[Table S1](#)). A major share out of this was due to consumption of smokeless tobacco products, amounting to 115,714.83 tonnes, followed by 40,846.15 tonnes contributed by cigarette associate waste and 13,769.51 tonnes due to bidi associated waste ([Supplementary Table S2](#)). Plastics constitute 43.2% of the waste with 73,500.66 tonnes, foils taking a share of 3.6% with 6074 tonnes and filters forming 0.8% with 1354.23 tonnes, while the rest 89,402.13 tonnes is constitutes paper, which if disposed mixed with plastics, renders it non-biodegradable ([Fig. 1](#)). State-wise estimates revealed that Uttar Pradesh (20.91%), Maharashtra (8.85%), West Bengal (8.57%), Bihar (6.57%) and Madhya Pradesh (6.22%) account nearly half of the wastes generated by tobacco use in the country ([Supplementary Tables S3–S6](#)).

India's National Green Tribunal has directed the Central Pollution Control Board in a recent ruling to frame guidelines for tobacco products waste; the focus however, remains only at the filter (cigarette and bidi butts), while the plastic, paper and foil components remain largely unaccounted.^{7,8} Taking cue from India's achievements in Climate Change Performance Index as a testament of commitment for environmental sustainability,⁹ a strict tobacco product waste reduction policy is needed which incorporates amendments in Environment Social Governance and the Plastic Waste Management Rules, listing tobacco related waste as hazardous, facilitating separate disposal. Extended producer responsibility should mark tobacco companies to bear the cost of clean-up, disposal, and recycling, coupled with rise in taxation, thereby funding the government borne clean-up expenses and public education campaigns. Further to drive the point home, the ban on single use plastics should be extended to cigarette filters and tobacco product packaging that will reduce the environmental burden tremendously.

In conclusion, along with its health and economic implications, the looming environmental threat posed by the tobacco products requires immediate attention. Governments should implement policies that address the issue of tobacco litter and hold tobacco companies accountable for the environmental impact of their products. Public education campaigns could also be



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*Corresponding author. C203, Department of Community Medicine and Family Medicine, Medical College, AIIMS, Jodhpur, Rajasthan 342005, India.

E-mail address: bhardwajp@aiimsjodhpur.edu.in (P. Bhardwaj).

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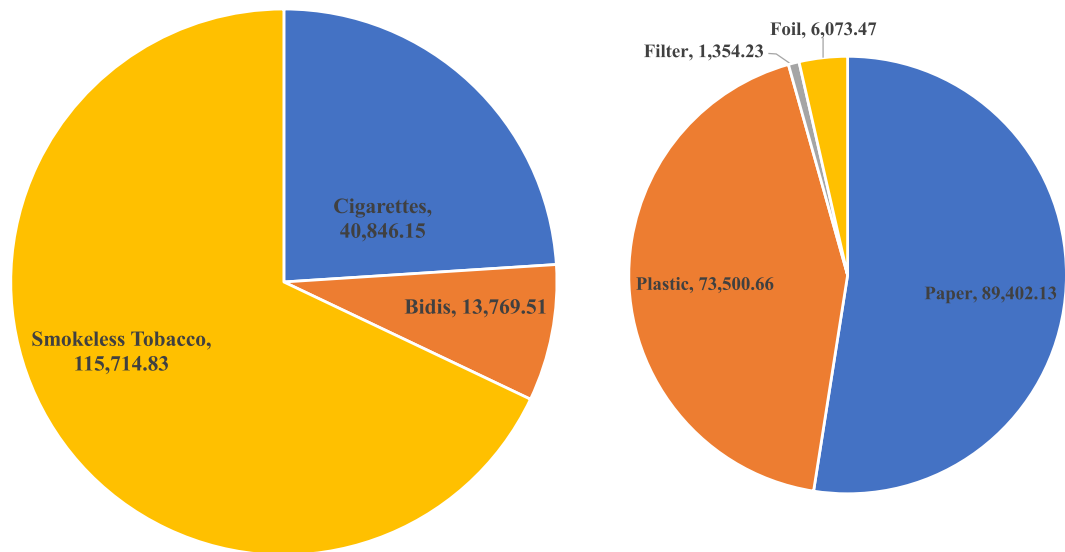


Fig. 1: Annual waste contributed by different tobacco products (left) in India and its segregated compositions (right)—in tonnes.

effective in increasing awareness of the issue and encourage people towards proper disposal of tobacco product related wastes.

Contributors

Y.K.J., P.B., N.K.J. and P.L. were involved in conceptualization and study design. Y.K.J., N.K.J. and P.K.S. were involved in data curation and formal analysis. P.B., N.K.J., M.K.G., A.D.G. and Y.K.J. contributed to funding acquisition, while P.B., P.L., P.P.S. and S.S. supervised the study. P.L. and S.K. provided resources for data collection and validated the findings.

Data sharing statement

Data are available upon reasonable request. All data relevant to the study are included in the article or uploaded as [Supplemental Information](#). Photographs of segregated weighing of different products and their packaging and filter components are available in an online repository, freely available on request.

Declaration of interests

The authors declare no conflict of interest.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.jansea.2023.100329>.

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