

The association of migration with multiple tobacco product use among male adults in 15 low-and middle-income countries.

Daniel Tzu-Hsuan Chen¹, Christopher Millett¹, Filippos T Filippidis¹

¹Public Health Policy Evaluation Unit, School of Public Health, Imperial College London,
United Kingdom

Corresponding author:

Daniel Tzu-Hsuan Chen; Room 319, Reynolds Building, Imperial College London, St.

Dunstan's Road, London W6 8RP, United Kingdom; Email: thc17@ic.ac.uk;

tel: +447708379781

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ABSTRACT

Little is known about the impact of migration on tobacco use patterns among men in low-and middle-income countries (LMICs). This study aims to explore the association between migration and tobacco use among men in LMICs. We used multilevel regression models to analyze data of 154,425 men from 15 countries from the latest wave of the Demographic and Health Survey (DHS). Results showed higher risk of single tobacco product use (Relative Risk Ratio [RRR]=1.22; 95% Confidence Interval [CI]: 1.19-1.26), but importantly of dual (RR=1.41, 95% CI: 1.36-1.49) and poly tobacco use (RR=1.71, 95% CI: 1.57-1.86) among migrant men compared to non-migrants.

INTRODUCTION:

Tobacco is projected to become the leading cause of death in low- and middle-income countries (LMICs)¹. Multiple tobacco product use is an important public health issue in LMICs, where the prevalence of dual (two tobacco products) or poly-tobacco use (more than two tobacco products) is high², especially among males with low socioeconomic status (SES)³. People who use multiple tobacco products may face increased health risks and nicotine addiction compared to exclusive users of a single tobacco product⁴..

There is a social gradient in tobacco use¹. Migrant populations typically have lower SES, poor health, and higher prevalence of tobacco use⁵. Such vulnerable populations also report lower motivation to quit, stronger addiction⁶ and are targeted by the tobacco industry⁶; hence, migrants may be at increased risk of dual and poly-tobacco use.

Labour migration in LMICs (i.e. workers who migrate away from home for work) accounts for approximately 60% of the world's migrant population. The majority of migrant workers (56%)⁷ and of tobacco users in LMICs are male⁸. However, little is known regarding the role of migration in the use of multiple tobacco products. Understanding this relationship could be an important step in reinforcing tobacco control policies to tackle tobacco use inequalities and associated health outcomes in migrants. This study aims to examine the association of migration with dual and poly-tobacco use among males in LMICs.

METHODS:

Data from 15 LMICs collected between 2015 and 2018 in the latest Demographic and Health Surveys (DHS) wave were analyzed. Countries included were India, Nepal, Cambodia, Ethiopia, Kenya, Tanzania, Zimbabwe, Malawi, Lesotho, Burundi, Ghana, Uganda, Angola, Armenia and Haiti. The DHS uses a multistage stratified random sampling (Population Proportional to Size approach), thus the samples are nationally representative⁹. A total of 154,425 male respondents aged 15-49 years (India: 15-54) were surveyed .

Main outcome variables of the study included current single, dual and poly-tobacco use, assessed through the question “do you currently smoke or use any other type of tobacco?”. Tobacco use was characterised as exclusive use of one tobacco product, concurrent use of two different products, or use of three or more tobacco products. We separately grouped users into dual/poly users within the same product group (combustible or smokeless) and dual/poly users across product groups (i.e. using at least one combustible and at least one smokeless product). Although tobacco products assessed varied between countries, data on tobacco use mainly includes cigarettes, pipes, cigars, smokeless tobacco products, water pipes/ hookahs and country specific tobacco products (i.e. gutkha/pan masala with tobacco, khaini and bidis in India; betel quid with tobacco and kreteks in Tanzania and Burundi).

The main independent variable was migration status. A respondent was defined as migrant if he had slept or resided away from home for more than one month in the last 12 months (binary variable). Other collected variables were age, education level, marital status, residential area, occupation and household wealth (divided into quintiles from 1 (lowest) to 5 (highest) separately for each country⁹). Further information on DHS variables have been presented elsewhere⁸.

Prevalence estimates of single, dual and poly-tobacco use among male migrants for each country were calculated. Due to the hierarchical nature of the data, the associations of migration status with single, dual and poly-tobacco use were examined by multilevel regression models. Models were fitted using MLwiN software from within Stata and adjusted for the independent variables mentioned above. Additional models were fitted to examine relationships of migration status with any tobacco use, and dual/poly use within and across product groups. All comparisons were made against non-tobacco use, and all estimates are weighted and nationally representative within each country.

RESULTS:

One-fifth (20.7%, n=32,160) of the male respondents surveyed were classified as migrants. The prevalence of multiple tobacco products use was generally high except for African countries. Both dual and poly-tobacco use were highest in Nepal (15.9% and 3.3% respectively) and India (10.4% and 3.2% respectively). Prevalence of different use patterns among male migrants by country is shown in Supplementary Table1.

Adjusted for individual demographic and SES variables, male migrants were at higher risk of single (Relative Risk Ratio [RRR]=1.22; 95% Confidence Interval [CI]: 1.19-1.26), dual

(RRR=1.41; 1.34-1.48), poly (RRR=1.71; 1.57-1.86), and any (RRR=1.28; 1.25-1.35) tobacco use compared to non-users. The association was similar for dual or poly-use within the same (RRR=1.32; 1.23-1.41), and across (RRR=1.59; 1.51-1.69) product groups. (Figure 1)

DISCUSSION:

Dual and poly-tobacco use was overall higher among male migrants in Western Pacific and South-East Asia region countries (Cambodia, India and Nepal) and in Armenia. These regions host substantial populations of migrant workers¹⁰ the majority of whom are male. The rapid industrialisation of developing countries leads to increased labour mobility and internal migrant flows of the male population from rural areas to places where manufacturing jobs are located⁷. Labour migrants are faced with more adverse health outcomes and quality of life, and are highly exposed to complex health risk behaviours such as smoking and multiple substance use^{3,5}.

The positive association of migrant status and use of tobacco products may reflect inequalities in smoking driven by the low SES reflecting limited social and economic resources in this disadvantaged population. These findings are consistent with previous studies that have found higher smoking prevalence among those of low SES and marginalized populations⁵. However, we found that this association is stronger for dual and poly-tobacco use, especially in combinations of combustible and smokeless products, compared to single and any use of tobacco. This could be explained by factors linked to personal characteristics, to available products and situational factors¹¹; these men split their time between locations with different availability of various tobacco products, as well as variable tobacco prices, regulations and cultural norms. These complex patterns of tobacco use, combined with objective and perceived barriers to receive health care and support for cessation⁶, highlight the additional risks that migrants face. Thus, tobacco control policies should specifically target these populations and

focus on preventing and reducing multiple tobacco use and overall tobacco consumption to relieve the health burden among migrants.

To our knowledge, this is the first study to examine the associations between multiple tobacco use in men and their migration status in LMICs. Adding to previous studies on links between socioeconomic factors and tobacco use^{3,5}, our analysis highlights the scarcely examined additional burden of multiple tobacco product use among migrants. We also covered several LMICs utilizing datasets that are comparable across multiple countries.

The current study relies on self-reported assessments which carry the risk of misclassification. Furthermore, while being away from home is often related to labour migration, it could indicate visiting relatives or friends, hospital stay or vacation etc. The diverse background and personal circumstances of migrants may also have differential impact on dual and poly-tobacco product use. Thus, understanding how the heterogeneous characteristics of migrant population influences tobacco use is important area for future research. Similarly, disentangling experimental from established dual/poly-tobacco use may provide more nuanced information. However, such distinctions were not possible in the current study due to lack of data or inconsistencies in questionnaires across countries. Future studies accounting for such factors could provide further insight into the relationship between migration and tobacco use. Our study highlights the need for research and policy to focus on migrant populations and their complex patterns of tobacco use.

Ethics approval:

Not applicable.

Conflicts of interest:

None.

Funding:

This study was an unfunded investigation.

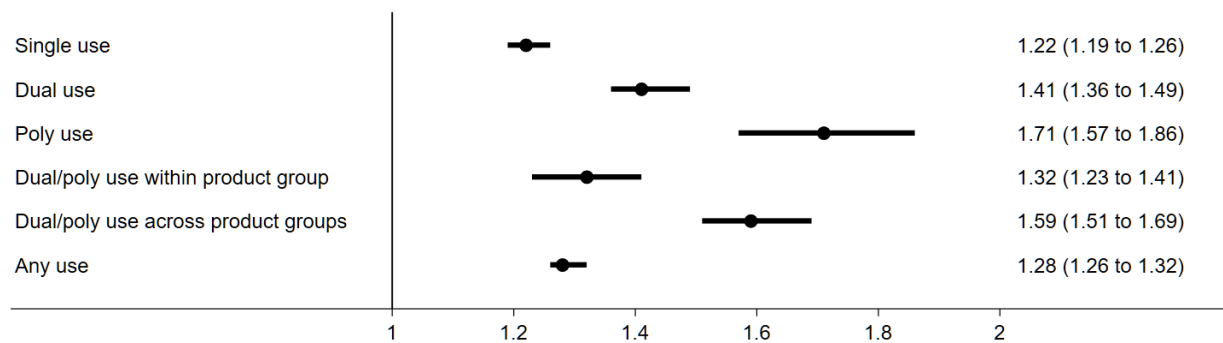
Key-points:

- Multiple tobacco product use poses substantial health risks especially among the vulnerable populations such as migrants.
- Results showed higher risk of single tobacco product use, but importantly of dual and poly tobacco use among migrant men compared to non-migrants.
- The study highlights the need for research and policy to focus on migrant populations and their complex patterns of tobacco use.

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Figure 1. Relative risk ratios of different tobacco use patterns among male migrants (vs. non-migrants) in 15 low-and middle-income countries.



Note :

1. Non-tobacco use as the base category, reported in Relative Risk Ratio, RRR with 95% confidence interval
2. RRR showed were adjusted for age, education level, marital status, residential area, occupation and household wealth using multilevel regression models for categorical responses.

Single use: individuals currently using only one tobacco product.

Dual use: individuals concurrently using two different tobacco products.

Poly use: individuals concurrently using three or more tobacco products.

Dual/poly use within product group: individuals concurrently using two or more tobacco products which are either within the combustible or the smokeless product group.

Dual/poly use across product groups: individuals concurrently using two or more combustible or smokeless tobacco products with at least one product from each product group.

Any use: individuals currently using any tobacco products.

Supplementary table 1. Weighted prevalence of current tobacco use among male migrants by different use patterns in 15 low-and middle-income countries.

Prevalence of tobacco use (%) and 95% confidence interval					
Country	Year of survey	Number of male migrants (%)	% Single ^a	% Dual ^b	% Poly ^c
Cambodia	2014/15	960 (34.6)	36.8 (33.1-40.7)	2.1 (1.3-3.4)	0.1 (0.1-1.8)
India	2015/16	18,730 (16.2)	31.2 (30.1-32.2)	10.4 (9.4-10.9)	3.2 (2.8-3.6)
Nepal	2016	1,070 (28.9)	29.1 (25.3-33.3)	15.9 (13.5-18.6)	3.3 (3.2-4.9)
Ethiopia	2016	1,563 (22.3)	2.3 (1.7-3.2)	0.2 (0.1-0.4)	0 (0 - 0)
Kenya	2014	2,189 (35.1)	15.7 (13.8-17.9)	1.2 (0.8-1.7)	0.2 (0.1-0.5)
Tanzania	2015/16	671 (36.9)	13.1 (10.1-16.9)	0.7 (0.3-1.9)	0.3 (0.1-1.1)
Zimbabwe	2015	1,246 (24.6)	10.4 (8.5-1.6)	1.4 (0.8-2.3)	0.2 (0.1-1.0)
Malawi	2015/16	934 (29.4)	9.5 (7.3-12.3)	0.3 (0.1-0.8)	0.5 (0.1-2.4)
Lesotho	2014	378 (33.9)	31.9 (26.8-37.4)	10.1 (9.5-14.9)	0.3 (0.1-1.2)
Burundi	2016/17	900 (30.6)	10.3 (8.4-12.6)	0.1 (0.1-0.8)	0 (0 - 0)
Ghana	2014	810 (31.5)	4.8 (3.3-6.9)	1.9 (0.6-5.4)	0.2 (0.1-1.3)
Uganda	2016	844 (29.9)	6.2 (4.8-8.1)	1.3 (0.5-3.4)	0 (0 - 0)
Angola	2015/16	642 (41.9)	16.9 (13.6-21.1)	2.6 (1.1-6.0)	0.3 (0.1-2.4)
Haiti	2016/17	912 (22.5)	10.6 (8.4-13.2)	1.5 (0.8-2.8)	0.6 (0.2-1.5)
Armenia	2015	320 (35.7)	62.7 (56.5-69.5)	3.8 (2.1-7.1)	0.7 (0.1-3.5)

Note:

a Single tobacco use: individuals currently using only one tobacco product.

b Dual tobacco use: individuals concurrently using two different tobacco products.

c Poly tobacco use: individuals concurrently using three or more tobacco products.