

Smoked Tobacco, Air pollution, and Tuberculosis in Lao PDR: Findings from a National Sample

Anne Berit Petersen^{1,2}, Natassia Muffley², Khamphithoun Somsamouth³, Pramil N. Singh^{1,2}

¹Loma Linda University Cancer Center (Transdisciplinary Tobacco Research Program), ²Loma Linda University (School of Nursing, School of Public Health), ³Ministry of Health Lao PDR (Center for Communication and Education on Health)

INTRODUCTION

- One in three of the world's smokers lives in the Western Pacific Region.
- In 2017, more than half of the global burden of disease from tuberculosis (TB), came from the Western Pacific Region (WPR).
- Smoking is causally linked to TB through pathways such as impaired mucociliary clearance of infectious pathogens.
- Mathematical modeling links tobacco smoking to TB in the WPR and further indicates that tobacco smoking is preventing the attainment of the Millennium Goal for TB control(1).
- Findings from our Asia Tobacco Control for Leadership Training Program (Fogarty/NIH) at Loma Linda University indicate high rates of tobacco and indoor air pollution exposure in Lao PDR and/or other nations of the WPR (1-3).

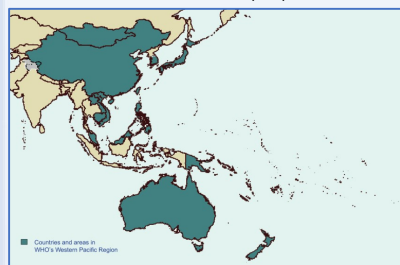


Figure 1. Western Pacific Region

AIMS

- To determine whether smoked tobacco contributes to higher rates of TB.
- To determine whether indoor air pollution sources (cooking fires, environmental tobacco smoke (ETS)) contribute to higher rates of TB.
- To determine whether outdoor air pollution sources (crop burning, trash fires) contribute to higher rates of TB.
- To determine whether the combination of smoking, indoor air pollution, and outdoor air pollution incrementally contribute to higher rates of TB.

MATERIALS & METHODS

- We analyzed data from the 2012 National Adult Tobacco Survey (NATSL) of Lao PDR—a multi-stage stratified cluster sample of 9706 subjects from 2822 households located in all 17 provinces.
- The survey included items from the Global Adult Tobacco Survey [24] and also included items on current health status, including TB diagnosis. Pictures and pictograms were used to measure various regional forms of tobacco, and exposure to indoor and outdoor cooking fires, trash burning, communal burning of crops, and indoor tobacco smoke.
- Tobacco and Air pollution exposures were related to TB in multivariable logistic regression models.

RESULTS



Smoked Tobacco



Indoor Cooking Fires



ETS-Enclosed Space



Communal Fires (i.e. Crop Burning, Trash fires)

RESULTS

- In multivariable models, we observed a significant increase in **odds of self-reported TB among those who smoked tobacco (OR = 1.73, 95% CI = (1.00 to 2.98))**.
- Larger multivariable models identified independent contributions from **exposure to tobacco pipes (OR = 21.51, 95% CI = (6.34 to 72.89))** and **communal outdoor fires (OR = 2.27, 95% CI = (1.15 to 4.49))**.
- An index measuring combined effect of up to 5 tobacco or air pollution exposures indicated **a significant 47% per increase in odds of TB per added exposure (OR per added exposure = 1.47, 95% CI = (1.14 to 1.89))**. This progression is depicted in Figure 2.

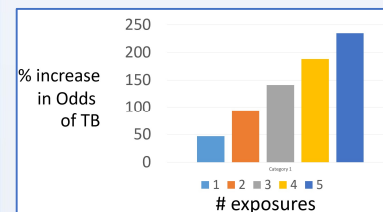


Figure 2. Five Exposure Model Findings (Smoked tobacco, ETS in enclosed workspace, indoor cooking fire, trash fires, other outdoor communal fires)

CONCLUSIONS

- For adults of Lao PDR, exposure to smoked tobacco and indoor and outdoor sources of air pollution additively increased the odds of TB.
- Our findings underscore the need for multi-sectoral collaboration between tobacco control, environmental health, TB prevention and treatment programs, policy makers, civil groups, and the private sector to address the convergence of potential risk factors impacting infectious respiratory disease in Lao PDR.

REFERENCES

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Contact: psingh@llu.edu