

# Effect of Natural Ventilation on Cooking Generated PM<sub>2.5</sub> and PM<sub>10</sub> in Kitchen and Living Room of Residential Buildings

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## INTRODUCTION

- Cooking at homes generates particulate matters (PM) which can affect the health of household members.
- Ventilation may modify the personal exposure level of PM.
- Natural ventilation by opening windows are common in Myanmar kitchens.

## AIM

- To assess the effect of natural ventilation on cooking generated PM<sub>2.5</sub> and PM<sub>10</sub> levels in the kitchen and living room.

## MATERIALS AND METHODS

The PM<sub>2.5</sub> and PM<sub>10</sub> levels were assessed by using Pocket PM<sub>2.5</sub> Sensors (Yaguchi Electric Co., Ltd., Miyagi, Japan, provided by National Institute for Environmental Studies, Japan) for 1 hour while boiling water with gas stove in 7 houses and electric stove in 5 houses. In order to get the natural ventilation, windows in the kitchen and living room were opened on day 1 and closed on day 2.



Fig. 1 Measuring PM levels using Pocket PM<sub>2.5</sub> Sensors (Yaguchi Electric Co., Ltd., Miyagi, Japan)

## RESULTS

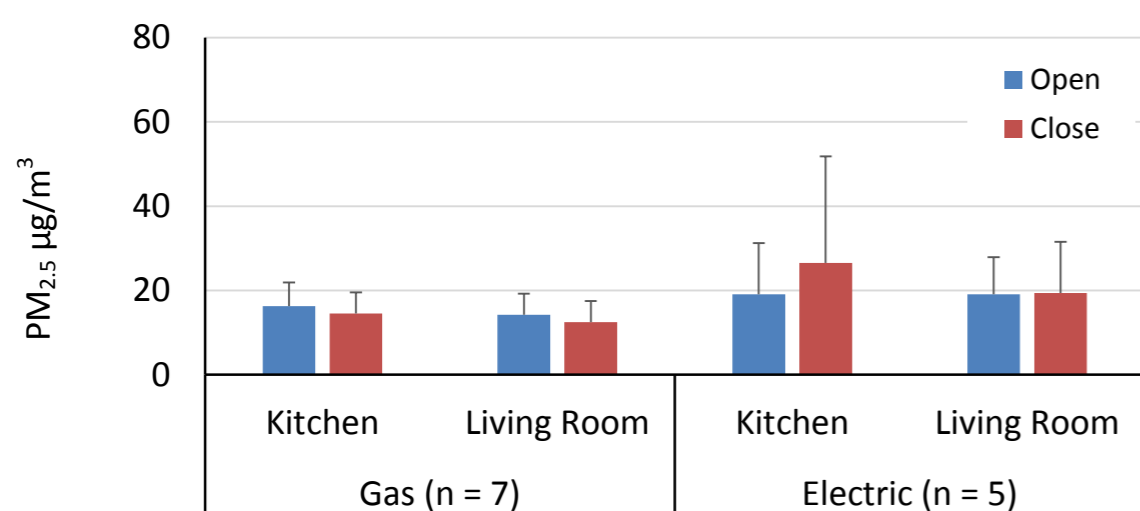


Fig. 2 Effect of ventilation on PM<sub>2.5</sub> levels in the kitchens and living rooms during cooking using electric stove and gas stove

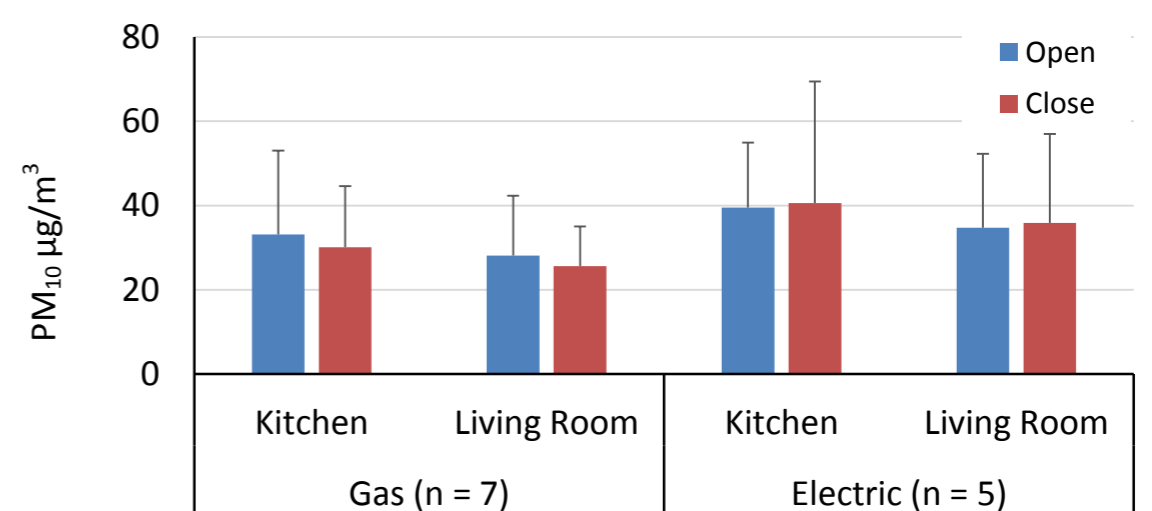


Fig. 3 Effect of ventilation on PM<sub>10</sub> levels in the kitchens and living rooms during cooking using electric stove and gas stove

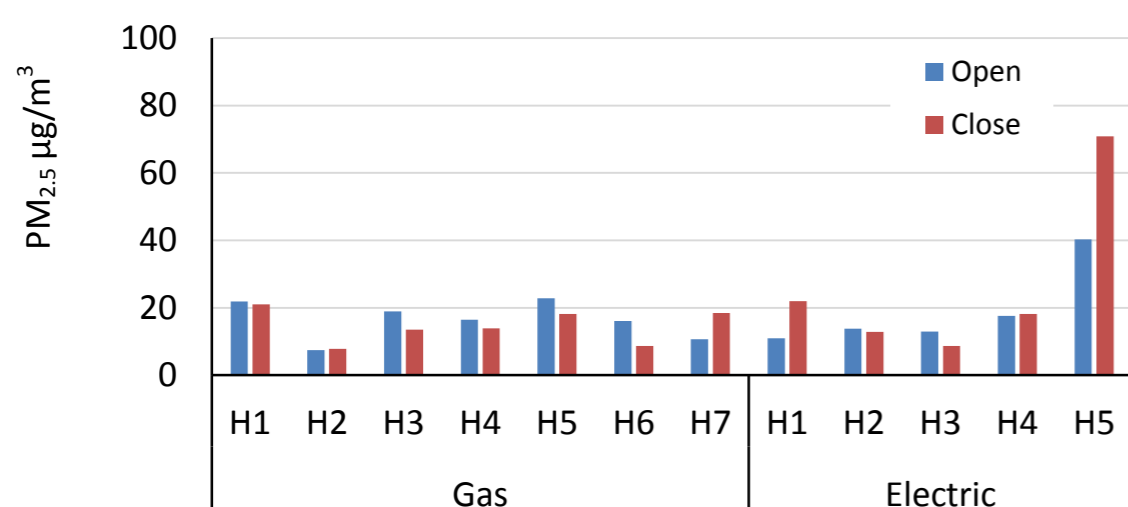


Fig. 4 Effect of ventilation on PM<sub>2.5</sub> levels in the kitchens of individual household during cooking using electric stove and gas stove

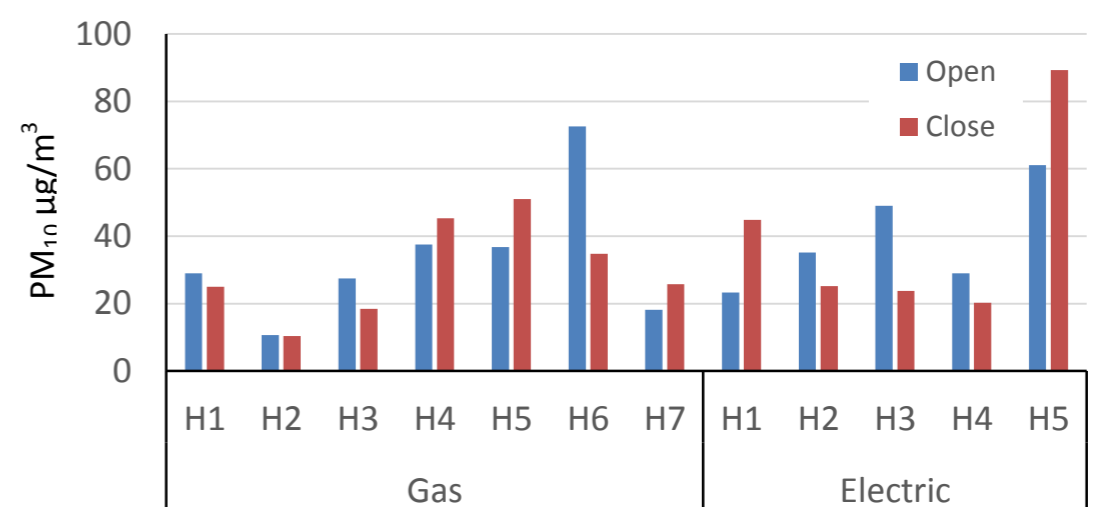


Fig. 5 Effect of ventilation on PM<sub>10</sub> levels in the kitchens of individual household during cooking using electric stove and gas stove

## DISCUSSION & CONCLUSION

- Natural ventilation alone has little effect on steam based cooking particulate matters emission.
- During the period with natural ventilation, a rise in PM<sub>2.5</sub> and PM<sub>10</sub> level was also found in some houses especially those situated near main roads with heavy traffic.
- Not only the natural ventilation but also type of residence such as apartment or house, type of cooking such as broiling, frying or soup, air direction, air circulation and wind speed may influence the indoor air quality of the kitchen and living rooms.