Pollutant Exposure of People Employed in Blue-Collar Jobs.

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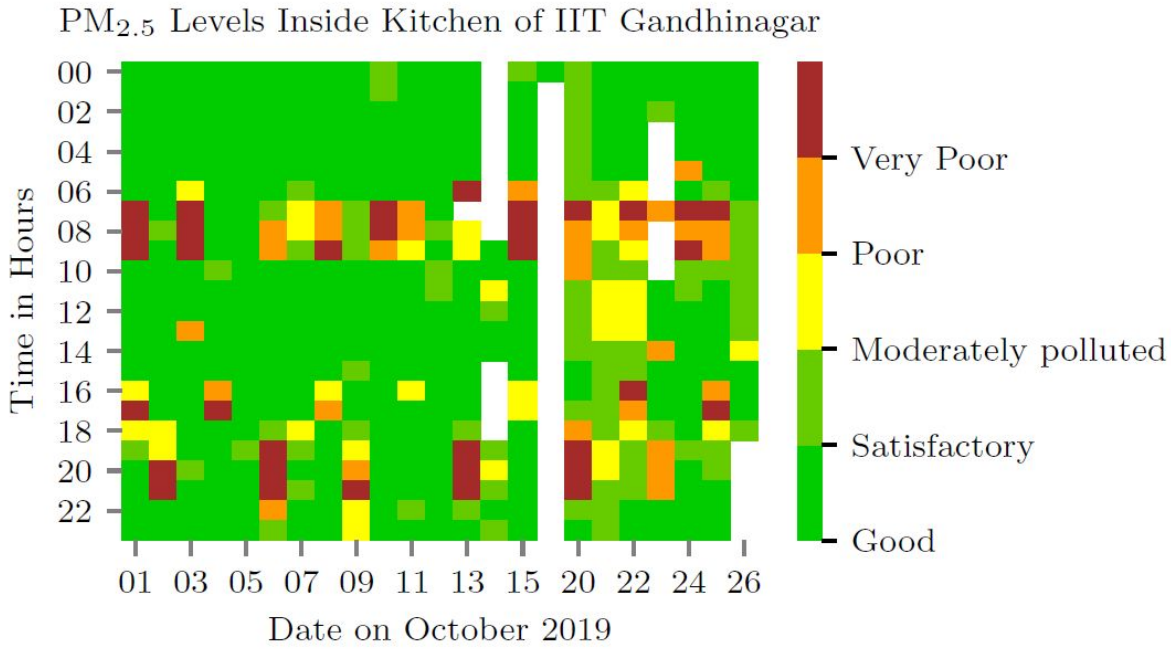
Background: Outdoor air pollution exposure is linked to the prevalence and incidence of COPD, attributing to loss of lung function and increased respiratory symptoms [1]. Blue-collar wage earners like construction, factory, live-stock workers are hypothetically exposed to higher pollutant irrespective of the city they live in. There is a need to monitor air pollution levels in areas such as construction sites, flour mill plants, stone quarry, and other such places besides measuring respiratory health parameters of these workers for timely intervention.

Method: In our initial study, we placed the PMS7003 air pollution sensor measuring PM2.5 and PM10 inside a large kitchen comprising of 7 cooks and more than 15 support staff. This kitchen caters to the need of food four times a day in a large academic campus. We hypothesized that workers inside the kitchen are exposed to higher air pollution than the level of pollution outside the kitchen.

Result: Figure 1 shows the hourly mean air pollution level inside the kitchen for October 2019. It appears that the pollution level is significant on almost all day from 7 AM to 9 AM and from 7 PM to 9 PM. which is correlated with breakfast and dinner preparation. Pollution level is also noticeable between 4 PM to 5.30 PM, which could be attributed either to snacks time or preparation activity for dinner. It is worth mentioning that very high pollutant occurs during Tuesdays and Saturdays, and this could be correlated to the item prepared in the kitchen.



Conclusion: Our study is in a preliminary stage, and we will require data across a semester to come up with a meaningful validated conclusion. Nevertheless, we have put up sensors in three more places outside the kitchen to differentiate between pollution levels.We plan to conduct large-scale spirometry studies colocated with exposure measurement in construction and other sites.

[1] Kurt, Ozlem Kar, Jingjing Zhang, and Kent E. Pinkerton. "Pulmonary health effects of air pollution." *Current opinion in pulmonary medicine* 22.2 (2016): 138.