

Indoor and Personal Monitoring

Methods

Participants with Family ID's that answered all relevant survey questions pertaining to time-activity patterns, an Indoor monitor, and/or who wore personal monitors, (N=21) were included in the data summary. Only participants who met all three criteria were included in statistical analysis (N=18).

Results

As reported by survey, participants spent 72% of their time within the home, 18% of their time at work, 2% of their time in transit (Table 1).

Location/activity	# participants	Mean (%)	Median(%)	SD (%)	range
Inside at home	21	72	73	19	33-100%
Work	21	18	15	17	0-54%
In Transit(traveling in vehicle)	21	2	0	3	0-8%
Outside at home	21	5	2	7	0-8%
Outside(not work or home)	21	7	3	9	0-23%

Table 1. Percentage of 24-hour day spent in each microenvironment or performing exposure-related activity for 21 participants

Eighteen of the participants reported that the vehicle used in transit was an automobile. Of the remaining three, two participants did not report leaving home during the 24 hours of monitoring and one participant reported traveling by bus and walking.

Using the GPS data, we were able to match TVOC concentrations to the major locations of home, work and in transit for 18 of the participants. We calculated summary statistics for these data (Table 2). We also looked at Pearson correlations between TVOC exposure concentrations at home to the other two locations.

Exposure location	N	Mean (ppm)	Median (ppm)	SD (ppm)	Pearson correlation to home exposure	p-value
Home	18	0.35	0.31	0.16	1	1
Work	17	0.45	0.30	0.30	-0.08	0.31
In transit	9	0.23	0.21	0.07	-0.25	0.28

Table 2. TVOC concentrations (ppm) in microenvironments

We found that participants had the highest mean exposures at work, but the highest median exposures at home. Surprisingly, we did not observe high concentrations in transit. No correlations were statistically significant.

When working participants were grouped by occupational category, we found that healthcare workers experienced the highest mean TVOC exposures and those in education had the lowest average exposures (Figure 1).

TVOC exposure by occupational category

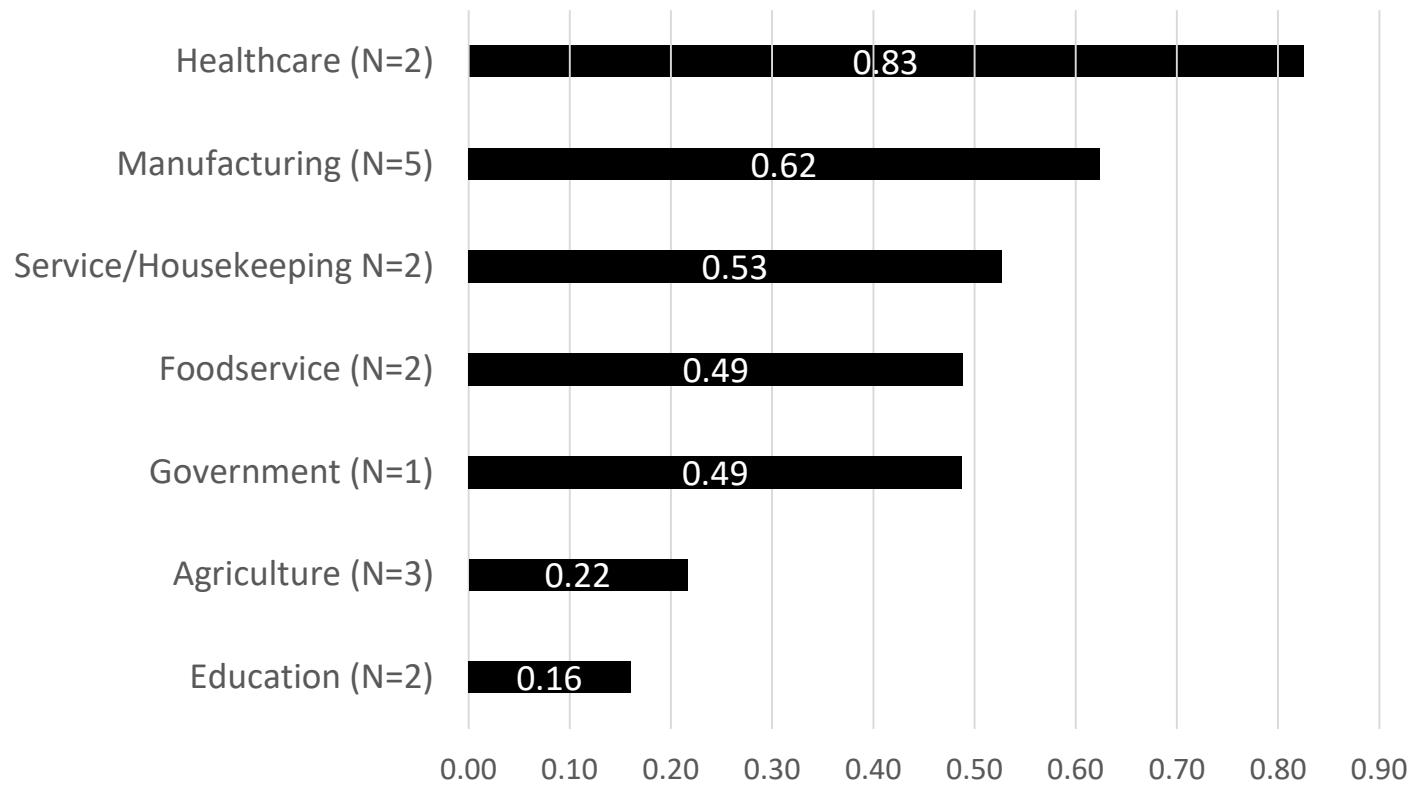


Figure 1. TVOC exposure at work in ppm by participant's self-reported occupational category.

When home exposures are compared by occupational category, we do not see the same pattern (Figure 2)

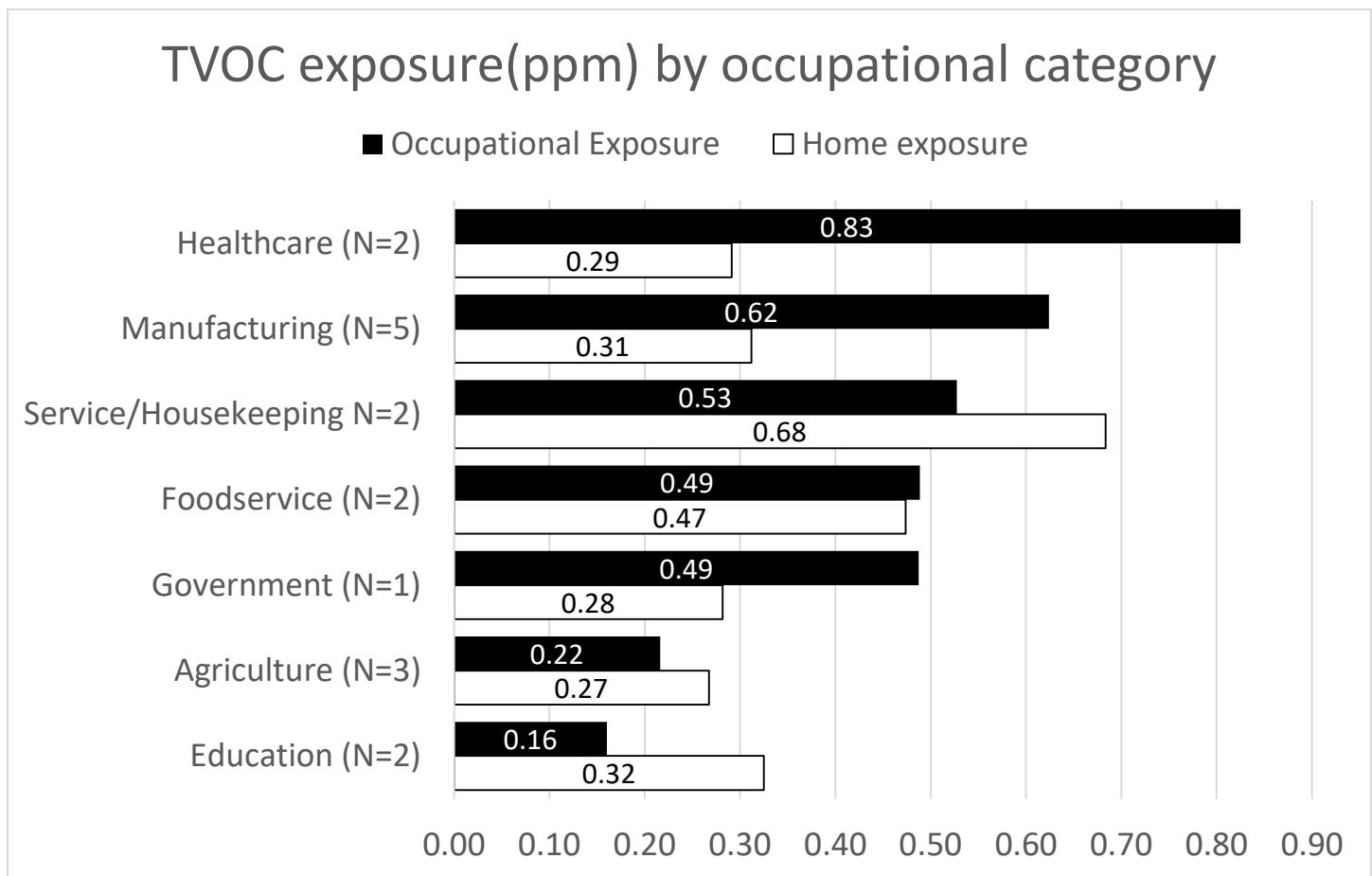


Figure 2. TVOC exposure at work and at home in ppm by participant's self-reported occupational category.

For the two healthcare workers, their occupational exposure to TVOCs is three times that of their at-home exposures. Similarly, the five manufacturing workers exposure two times TVOC exposure at work compared to at home. In the occupational groups with the lowest occupation exposures, the at home exposure is higher than the at work exposure. This figure and data serve to demonstrate the variability of exposure to TVOCs. It is additionally likely, given the general TVOC sensor used in the instrument, that the exact VOC to which each participant was exposed is different. This is potentially true across and within occupational categories and between home and work exposures.

Conclusions

We observed that the 21 participants in our personal exposure study spent the majority of their time indoors, primarily at home. This is to be expected both because sleeping at home takes up a large portion of the 24-hour day, but also because of trends reported elsewhere. Similarly, we observed that the majority of those who left home used an automobile; only 1 person reported using the bus.

The interpretation of these data are greatly limited by the small sample size. However, we were able to observe considerable variation in exposure. While this is not particularly informative from an intervention standpoint, it is useful to know when thinking ahead to examining the occupational and residential exposures in the SJV.