

## Supplementary data

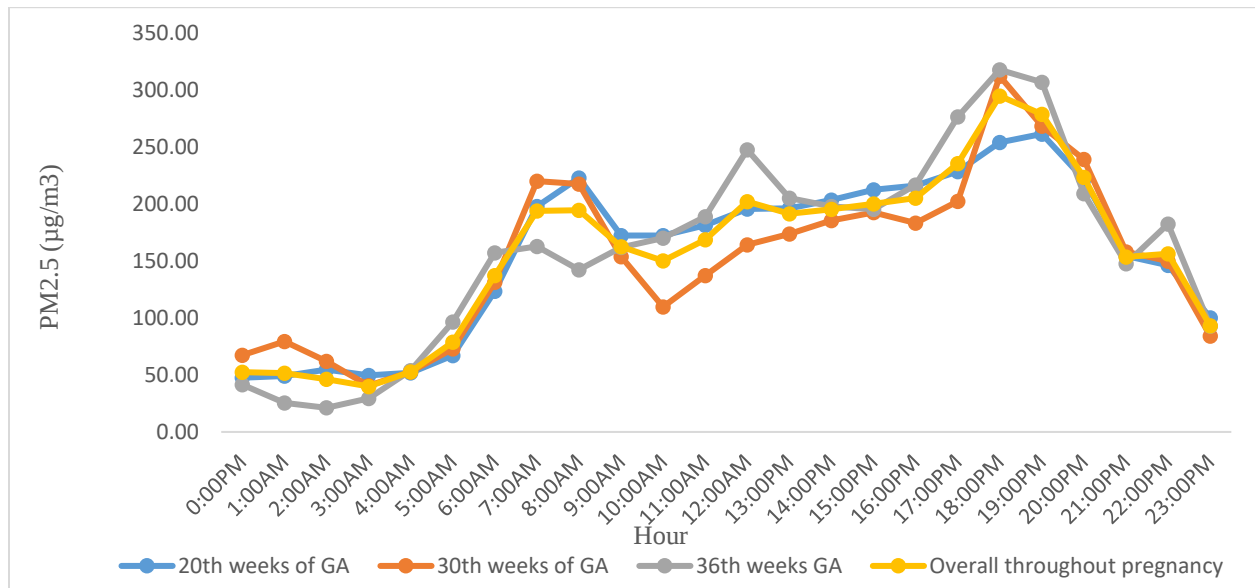
### Raw sensor readings

#### Mean personal PM<sub>2.5</sub> exposure level among pregnant women

Table 1: Comparison of log-transformed mean PM<sub>2.5</sub> exposure level across different characteristics of pregnant women in rural Butajira Ethiopia 2025

| Characteristics                     | Mean PM <sub>2.5</sub> , (SD)<br>( $\mu\text{g}/\text{m}^3$ ) | Type of test<br>used | Estimated<br>value | P-value |
|-------------------------------------|---------------------------------------------------------------|----------------------|--------------------|---------|
| GM PM <sub>2.5</sub>                |                                                               |                      |                    |         |
| 20 <sup>th</sup> weeks of gestation | 155.1 (1.5)                                                   | One-way<br>ANOVA     | 3.42               | 0.045   |
| 30 <sup>th</sup> weeks of gestation | 153.5 (1.4)                                                   |                      |                    |         |
| 36 <sup>th</sup> weeks of gestation | 163.7 (1.4)                                                   |                      |                    |         |
| Ecology                             |                                                               |                      |                    |         |
| Highland                            | 167.7 (1.4)                                                   | One-way<br>ANOVA     | 10.54              | <0.0001 |
| Midland                             | 153.4 (1.5)                                                   |                      |                    |         |
| Lowland                             | 149.0 (1.4)                                                   |                      |                    |         |
| Spouse negligence                   |                                                               |                      |                    |         |
| Yes                                 | 166.3 (1.5)                                                   | Two-sample<br>t-test | -2.23              | 0.0018  |
| No                                  | 154.2 (1.4)                                                   |                      |                    |         |
| Wealth index                        |                                                               |                      |                    |         |
| Lowest                              | 166.7 (1.4)                                                   | One-way<br>ANOVA     | 9.22               | 0.0001  |
| Middle                              | 153.8 (1.4)                                                   |                      |                    |         |
| Highest                             | 149.0 (1.5)                                                   |                      |                    |         |
| Roof material made of               |                                                               |                      |                    |         |
| Corrugated iron                     | 153.8 (1.5)                                                   | Two-sample<br>t-test | -3.41              | < 0.001 |
| Thatch roof                         | 168.2 (1.4)                                                   |                      |                    |         |
| Type of fuel used                   |                                                               |                      |                    |         |
| Wood                                | 157.6 (1.3)                                                   | One-way<br>ANOVA     | 4.67               | 0.002   |
| Animal and crop residues            | 161.9 (1.4)                                                   |                      |                    |         |
| Charcoal                            | 152.5 (1.4)                                                   |                      |                    |         |
| No. times women cooked in a day     |                                                               |                      |                    |         |
| One                                 | 156.5 (1.4)                                                   | One-way<br>ANOVA     | 2.04               | 0.1065  |
| Two                                 | 153.9 (1.4)                                                   |                      |                    |         |
| Three                               | 157.8 (1.4)                                                   |                      |                    |         |
| Four                                | 172.2 (1.4)                                                   |                      |                    |         |
| Time spent to prepare lunch         |                                                               |                      |                    |         |
| <= One hour                         | 152.0 (1.4)                                                   | Two-sample<br>t-test | -2.92              | 0.0018  |
| > One hour                          | 162.2 (1.5)                                                   |                      |                    |         |
| Total time spent in cooking         |                                                               |                      |                    |         |
| <= Five hours                       | 152.0 (1.4)                                                   | Two-sample<br>t-test | -2.47              | 0.047   |
| > Five hours                        | 158.4 (1.4)                                                   |                      |                    |         |

### Hourly average PM<sub>2.5</sub> exposure pattern among pregnant women



**Figure 1:** Hourly average personal PM<sub>2.5</sub> exposure level among pregnant women in rural Butajira, Ethiopia 2025

**Table 2:** Mixed-fixed analysis to assess factors associated with personal PM<sub>2.5</sub> exposure level in rural Butajira, Ethiopia 2025

| Variables                                                | $\beta$ | SE   | Z-value | P-value | 95% CI   |          |
|----------------------------------------------------------|---------|------|---------|---------|----------|----------|
|                                                          |         |      |         |         | Lower CI | Upper CI |
| Intercept                                                | 4.2     | 0.11 | 37.32   | <0.001  | 4.02     | 4.47     |
| Time to measure PM <sub>2.5</sub>                        | 0.03    | 0.01 | 2.56    | 0.01    | 0.01     | 0.06     |
| Age                                                      | 0.04    | 0.03 | 2.6     | 0.004   | 0.02     | 0.3      |
| Women occupational ( <i>Housewife</i> )                  | 0.18    | 0.05 | 3.40    | 0.001   | 0.08     | 0.29     |
| Partner occupational ( <i>ref. other</i> )               |         |      |         |         |          |          |
| Farmer                                                   | 0.12    | 0.05 | 2.49    | 0.013   | 0.03     | 0.21     |
| Daily laborer                                            | 0.08    | 0.06 | 1.45    | 0.148   | -0.03    | 0.20     |
| Ecological living area of women ( <i>ref. lowland</i> )  |         |      |         |         |          |          |
| Highland                                                 | 0.07    | 0.03 | 1.98    | 0.048   | 0.0007   | 0.14     |
| Midland                                                  | -0.06   | 0.04 | -1.81   | 0.070   | -0.14    | 0.006    |
| Roof material of the house ( <i>Thatch roof</i> )        | 0.07    | 0.04 | 2.08    | 0.038   | 0.004    | 0.14     |
| Assets index ( <i>ref. last</i> )                        |         |      |         |         |          |          |
| Lowest                                                   | 0.08    | 0.03 | 2.38    | 0.017   | 0.01     | 0.14     |
| Middle                                                   | 0.02    | 0.03 | 0.44    | 0.657   | -0.05    | 0.08     |
| Using animal and agricultural residues as source of fuel | 0.16    | 0.07 | 2.24    | 0.025   | 0.02     | 0.30     |
| Total time spent in cooking ( <i>&gt;five hours</i> )    | 0.09    | 0.04 | 2.19    | 0.029   | 0.009    | 0.17     |
| Spouse negligence ( <i>yes</i> )                         | 0.07    | 0.03 | 2.23    | 0.026   | 0.008    | 0.12     |