# Associations between household air pollution and early child development among 36 to 59 months old children in Bangladesh

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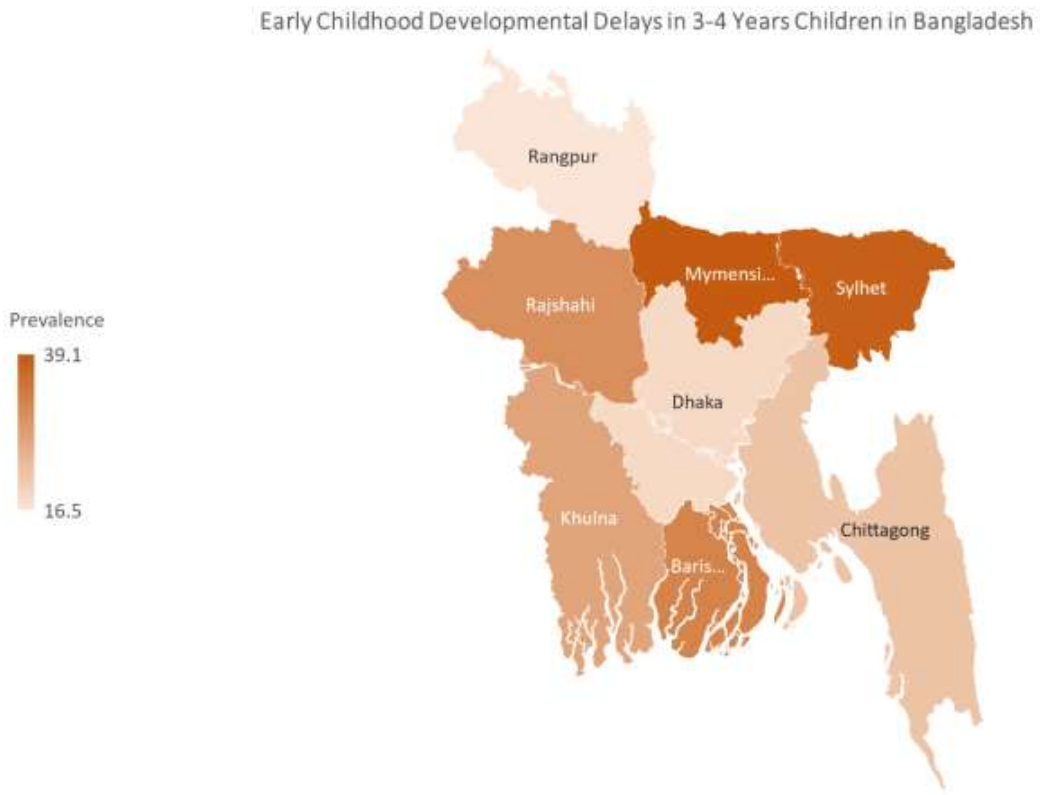
## Supplementary Figure

**Figure S1: Regional variation in early childhood developmental delays**






Rana J, *et al. J Epidemiol Community Health* 2022; 76:667–676. doi: 10.1136/jech-2021-217554

## Supplementary Tables

**Table S1: Association between SFU and global ECDI stratified by sex of the children**

| **Predictors** | **Overall (Model I)** | **Boy (Model II)** | **Girl (Model III)** |
|---|---|---|---|
| | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** |
| **Unadjusted PRs (*N*=9395)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.66 (1.46, 1.89) *** | 1.52 (1.30, 1.79) *** | 1.93 (1.57, 2.38) *** |
| **[a]Adjusted PRs (*N*=9202)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.47 (1.25, 1.73) *** | 1.37 (1.13, 1.65) ** | 1.64 (1.31, 2.07) *** |
| Sex of child | (Ref=Boy) | (Ref=Boy) | (Ref=Girl) |
| | 0.76 (0.70, 0.83) *** | 0.64 (0.50, 0.82) *** | 1.55 (1.21, 1.98) *** |
| Child age (in years) | 0.65 (0.60, 0.72) *** | 0.66 (0.60, 0.72) *** | 0.66 (0.60, 0.72) *** |
| Ever attended ECE Program (Ref=No) | | | |
| Yes | 0.66 (0.58, 0.76) *** | 0.66 (0.58, 0.76) *** | 0.66 (0.58, 0.76) *** |
| Iodine Intake (Ref=No) | | | |
| Yes | 0.96 (0.87, 1.06) | 0.96 (0.87, 1.06) | 0.96 (0.87, 1.06) |
| Stunting (Ref=No) | | | |
| Yes | 1.09 (1.00, 1.20) | 1.09 (1.00, 1.20) | 1.09 (1.00, 1.20) |
| Maternal Age | 1.00 (0.99, 1.01) | 1.00 (0.99, 1.01) | 1.00 (0.99, 1.01) |
| Maternal Education Level (Ref=Pre-primary or none) | | | |
| Primary | 0.96 (0.84, 1.10) | 0.96 (0.84, 1.10) | 0.96 (0.84, 1.10) |
| Secondary | 0.79 (0.69, 0.91) ** | 0.79 (0.69, 0.91) ** | 0.79 (0.69, 0.91) ** |
| Higher Secondary+ | 0.68 (0.56, 0.82) *** | 0.68 (0.56, 0.82) *** | 0.68 (0.56, 0.82) *** |
| Household Wealth Quintiles (Ref=Poorest) | | | |
| Poorer | 1.06 (0.93, 1.20) | 1.06 (0.93, 1.20) | 1.06 (0.93, 1.20) |
| Middle | 1.00 (0.88, 1.14) | 1.00 (0.88, 1.14) | 1.00 (0.88, 1.15) |
| Richer | 0.95 (0.82, 1.09) | 0.95 (0.82, 1.09) | 0.95 (0.82, 1.09) |
| Richest | 0.82 (0.69, 0.98) * | 0.82 (0.69, 0.98) * | 0.82 (0.69, 0.98) * |
| Cooking Place (Ref=Main Room) | | | |
| Separate | 0.90 (0.81, 1.00) * | 0.90 (0.81, 1.00) * | 0.90 (0.81, 1.00) * |
| Outdoor | 0.90 (0.80, 1.01) | 0.90 (0.81, 1.01) | 0.90 (0.80, 1.01) |
| Urbanicity (Ref=Rural) | | | |
| Urban | 1.10 (0.97, 1.25) | 1.11 (0.98, 1.25) | 1.11 (0.98, 1.25) |
| Season (Ref=Winter) | | | |
| Summer | 0.96 (0.88, 1.05) | 0.96 (0.89, 1.05) | 0.96 (0.89, 1.05) |
| SFU*Sex | - | **Ref=SFU*Girl** | **Ref= SFU*Boy** |
| | | 0.83 (0.64, 1.08) | 1.20 (0.93, 1.56) |

[a]Prevalence ratios (PRs) were adjusted for child age, ECE, iodine intake, stunting, maternal age, maternal education, household wealth index, cooking place, season, and urbanicity. * p<0.05, ** p<0.01, *** p<0.001.

**Table S2: Association between SFU and global ECDI stratified by urbanicity**

| **Predictors** | **Overall (Model I)** | **Rural (Model II)** | **Urban (Model III)** |
|---|---|---|---|
| | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** |
| **Unadjusted PRs(*N*=9395)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.66 (1.46, 1.89) *** | 1.64 (1.63, 1.64)*** | 1.79 (1.78, 1.79) *** |
| [a]**Adjusted PRs(*N*=9202)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.47 (1.25, 1.73) *** | 1.40 (1.13, 1.74) ** | 1.54 (1.24, 1.91) *** |
| Sex of child | (Ref=Boy) | (Ref=Girl) | (Ref=Girls) |
| | 0.76 (0.70, 0.83) *** | 1.32 (1.21, 1.43) *** | 1.32 (1.21, 1.43) *** |
| Child age (in years) | 0.65 (0.60, 0.72) *** | 0.65 (0.60, 0.72) *** | 0.66 (0.60, 0.72) *** |
| Ever attended ECE Program (Ref=No) | | | |
| Yes | 0.66 (0.58, 0.76) *** | 0.66 (0.58, 0.76) *** | 0.66 (0.58, 0.76) *** |
| Iodine Intake (Ref=No) | | | |
| Yes | 0.96 (0.87, 1.06) | 0.96 (0.87, 1.06) | 0.96 (0.87, 1.06) |
| Stunting (Ref=No) | | | |
| Yes | 1.09 (1.00, 1.20) | 1.09 (1.00, 1.20) * | 1.10 (1.00, 1.20) * |
| Maternal Age | 1.00 (0.99, 1.01) | 1.00 (0.99, 1.01) | 1.00 (0.99, 1.01) |
| Maternal Education Level (Ref=Pre-primary or none) | | | |
| Primary | 0.96 (0.84, 1.10) | 0.96 (0.84, 1.10) | 0.96 (0.84, 1.10) |
| Secondary | 0.79 (0.69, 0.91) ** | 0.79 (0.69, 0.91) ** | 0.79 (0.69, 0.91) ** |
| Higher Secondary+ | 0.68 (0.56, 0.82) *** | 0.68 (0.56, 0.82) *** | 0.68 (0.56, 0.82) *** |
| Household Wealth Quintiles (Ref=Poorest) | | | |
| Poorer | 1.06 (0.93, 1.20) | 1.06 (0.93, 1.20) | 1.06 (0.93, 1.20) |
| Middle | 1.00 (0.88, 1.14) | 1.00 (0.88, 1.14) | 1.00 (0.88, 1.14) |
| Richer | 0.95 (0.82, 1.09) | 0.94 (0.82, 1.09) | 0.94 (0.82, 1.09) |
| Richest | 0.82 (0.69, 0.98) * | 0.82 (0.69, 0.98) * | 0.82 (0.69, 0.98) * |
| Cooking Place (Ref=Main Room) | | | |
| Separate | 0.90 (0.81, 1.00) * | 0.90 (0.81, 1.00) * | 0.90 (0.81, 1.00) * |
| Outdoor | 0.90 (0.80, 1.01) | 0.90 (0.80, 1.01) | 0.90 (0.81, 1.01) |
| Urbanicity (Ref=Rural) | | | |
| Urban | 1.10 (0.97, 1.25) | 1.03 (0.80, 1.32) | 0.97 (0.76-1.25) |
| Season (Ref=Winter) | | | |
| Summer | 0.96 (0.88, 1.05) | 0.96 (0.88, 1.05) | 0.96 (0.89, 1.05) |
| SFU*Urbanicity | - | **Ref=SFU*Urban** | **Ref= SFU*Rural** |
| | | 0.91 (0.68, 1.21) | 1.10 (0.83, 1.46) |

[a]Prevalence ratios (PRs) were adjusted for child age and sex, ECE, iodine intake, stunting, maternal age, maternal education, household wealth index, cooking place, and season. * p<0.05, ** p<0.01, *** p<0.001.

**Table S3: Association between SFU and learning-cognition stratified by sex of the children**

| **Predictors** | **Overall (Model I)** | **Boy (Model II)** | **Girl (Model III)** |
|---|---|---|---|
| | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** |
| **Unadjusted PRs (*N*=9395)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.98 (1.50, 2.60)*** | 1.87 (1.35, 2.58) *** | 2.18 (1.45, 3.28) *** |
| **Adjusted PRs (*N*=9202)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.90 (1.39, 2.60) *** | 1.86 (1.28, 2.70) ** | 2.05 (1.34, 3.11) ** |
| Sex of child | (Ref=Boy) | (Ref=Boy) | (Ref=Girl) |
| | 0.92 (0.79, 1.06) | 0.85 (0.54, 1.34) | 1.17 (0.74, 1.85) |
| Child age (in years) | 0.72 (0.61, 0.84) *** | 0.72 (0.61, 0.84) *** | 0.71 (0.61, 0.83) *** |
| Ever attended ECE Program (Ref=No) | | | |
| Yes | 0.61 (0.48, 0.79) *** | 0.62 (0.48, 0.79) *** | 0.64 (0.50, 0.82) *** |
| Iodine Intake (Ref=No) | | | |
| Yes | 1.17 (0.98, 1.41) | 1.17 (0.97, 1.40) | 1.18 (0.98, 1.41) |
| Stunting (Ref=No) | | | |
| Yes | 1.10 (0.94, 1.29) | 1.13 (0.96, 1.33) | 1.11 (0.95, 1.30) |
| Maternal Age | 1.00 (0.99, 1.01) | 1.00 (0.99, 1.01) | 1.00 (0.99, 1.01) |
| Maternal Education Level (Ref=Pre-primary or none) | | | |
| Primary | 0.85 (0.67, 1.06) | 0.84 (0.67, 1.06) | 0.84 (0.67, 1.05) |
| Secondary | 0.66 (0.52, 0.84) ** | 0.67 (0.53, 0.84) ** | 0.65 (0.52, 0.83) *** |
| Higher Secondary+ | 0.70 (0.50, 0.97) * | 0.71 (0.51, 0.98) * | 0.70 (0.50, 0.97) ** |
| Household Wealth Quintiles (Ref=Poorest) | | | |
| Poorer | 1.05 (0.84, 1.32) | 1.01 (0.81, 1.26) | 1.04 (0.83, 1.30) |
| Middle | 0.97 (0.76, 1.23) | 0.92 (0.73, 1.17) | 0.95 (0.75, 1.21) |
| Richer | 0.79 (0.60, 1.03) | 0.75 (0.57, 0.98) * | 0.78 (0.60, 1.01) |
| Richest | 0.81 (0.59, 1.10) | 0.78 (0.57, 1.06) | 0.81 (0.59, 1.10) |
| Cooking Place (Ref= Main Room) | | | |
| Separate | 0.82 (0.68, 1.00) * | 0.81 (0.67, 0.98) * | 0.83 (0.68, 1.00) |
| Outdoor | 0.82 (0.67, 1.01) | 0.81 (0.66, 0.99) * | 0.82 (0.67, 1.00) |
| Urbanicity (Ref=Rural) | | | |
| Urban | 1.12 (0.87, 1.43) | 1.11 (0.87, 1.42) | 1.13 (0.88, 1.44) |
| Season (Ref= Winter) | | | |
| Summer | 0.86 (0.73, 1.03) | 0.87 (0.73, 1.04) | 0.87 (0.73, 1.03) |
| SFU*Sex | - | **Ref= SFU*Girl** | **Ref=SFU*Boy** |
| | | 0.93 (0.57, 1.51) | 1.08 (0.66, 1.75) |

[a]Prevalence ratios (PRs) were adjusted for age of children, child age, ECE, iodine intake, stunting, maternal age, maternal education, household wealth index, cooking place, season, and urbanicity. * p<0.05, ** p<0.01, *** p<0.001.

**Table S4: Association between SFU and learning-cognition stratified by urbanicity**

| **Predictors** | **Overall (Model I)** | **Rural (Model II)** | **Urban (Model III)** |
|---|---|---|---|
| | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** |
| **Unadjusted PRs (*N*=9395)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.98 (1.50, 2.60)*** | 1.89 (1.26, 2.82)** | 2.32 (1.52, 3.52)*** |
| **[a]Adjusted PRs (*N*=9202)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.90 (1.39, 2.60) *** | 1.77 (1.16, 2.70) ** | 2.17 (1.43, 3.28) *** |
| Sex of child | (Ref=Boy) | (Ref=Girl) | (Ref=Girl) |
| | 0.92 (0.79, 1.06) | 1.08 (0.93, 1.25) | 1.09 (0.94, 1.26) |
| Child age (in years) | 0.72 (0.61, 0.84) *** | 0.71 (0.61, 0.83) *** | 0.73 (0.62, 0.85) *** |
| Ever attended ECE Program (Ref=No) | | | |
| Yes | 0.61 (0.48, 0.79) *** | 0.63 (0.49, 0.81) *** | 0.61 (0.48, 0.79) *** |
| Iodine Intake (Ref=No) | | | |
| Yes | 1.17 (0.98, 1.41) | 1.17 (0.98, 1.40) | 1.17 (0.98, 1.40) |
| Stunting (Ref=No) | | | |
| Yes | 1.10 (0.94, 1.29) | 1.10 (0.94, 1.29) | 1.10 (0.93, 1.29) |
| Maternal Age | 1.00 (0.99, 1.01) | 1.00 (0.99, 1.01) | 1.00 (0.99, 1.01) |
| Maternal Education Level (Ref=Pre-primary or none) | | | |
| Primary | 0.85 (0.67, 1.06) | 0.83 (0.66, 1.04) | 0.83 (0.66, 1.05) |
| Secondary | 0.66 (0.52, 0.84) ** | 0.64 (0.51, 0.82) *** | 0.65 (0.52, 0.83) *** |
| Higher Secondary+ | 0.70 (0.50, 0.97) * | 0.69 (0.50, 0.96) * | 0.70 (0.50, 0.97) * |
| Household Wealth Quintiles (Ref=Poorest) | | | |
| Poorer | 1.05 (0.84, 1.32) | 1.04 (0.83, 1.31) | 1.02 (0.81, 1.27) |
| Middle | 0.97 (0.76, 1.23) | 0.95 (0.75, 1.21) | 0.93 (0.74, 1.19) |
| Richer | 0.79 (0.60, 1.03) | 0.78 (0.60, 1.02) | 0.75 (0.58, 0.98) * |
| Richest | 0.81 (0.59, 1.10) | 0.81 (0.60, 1.11) | 0.79 (0.58, 1.08) |
| Cooking Place (Ref= Main Room) | | | |
| Separate | 0.82 (0.68, 1.00) * | 0.83 (0.68, 1.00) | 0.81 (0.67, 0.99) * |
| Outdoor | 0.82 (0.67, 1.01) | 0.82 (0.67, 1.01) | 0.81 (0.66, 0.99) * |
| Urbanicity (Ref=Rural) | | | |
| Urban | 1.12 (0.87, 1.43) | 0.97 (0.59,1.60) | 1.05 (0.63, 1.73) |
| Season (Ref= Winter) | | | |
| Summer | 0.86 (0.73, 1.03) | 0.87 (0.73, 1.03) | 0.86 (0.73, 1.02) |
| SFU*Urbanicity | - | **Ref=SFU*Urban** | **Ref= SFU*Rural** |
| | | 0.81 (0.46, 1.41) | 1.21 (0.69, 2.11) |

[a]Prevalence ratios (PRs) were adjusted for child age and sex, ECE, iodine intake, stunting, maternal age, maternal education, household wealth index, cooking place, and season. * p<0.05, ** p<0.01, *** p<0.001.

**Table S5: Association between SFU and socio-emotional stratified by sex of the children**

| **Predictors** | **Overall (Model I)** | **Boy (Model II)** | **Girl (Model III)** |
|---|---|---|---|
| | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** |
| **Unadjusted PRs (*N*=9395)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.22 (1.09, 1.37) ** | 1.22 (1.06,1.41) ** | 1.23 (1.03,1.46) ** |
| **[a]Adjusted PRs (*N*=9202)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.17 (1.01, 1.36) * | 1.18 (0.99, 1.40) | 1.16 (0.96, 1.42) |
| Sex of child | (Ref=Boy) | (Ref=Boy) | (Ref=Girl) |
| | 0.75 (0.69, 0.82) *** | 0.76 (0.62, 0.93) * | 1.31 (1.07, 1.61) ** |
| Child age (in years) | 0.86 (0.79, 0.94) ** | 0.86 (0.79, 0.94) *** | 0.86 (0.79, 0.94) ** |
| Ever attended ECE Program (Ref=No) | | | |
| Yes | 1.05 (0.94, 1.17) | 1.05 (0.94, 1.17) | 1.05 (0.94, 1.17) |
| Iodine Intake (Ref=No) | | | |
| Yes | 1.00 (0.91, 1.10) | 1.00 (0.91, 1.10) | 1.00 (0.91, 1.10) |
| Stunting (Ref=No) | | | |
| Yes | 1.03 (0.94, 1.13) | 1.03 (0.94, 1.13) | 1.03 (0.94, 1.13) |
| Maternal Age | 1.00 (0.99, 1.01) | 1.00 (0.99, 1.01) | 1.00 (0.99, 1.01) |
| Maternal Education Level (Ref=Pre-primary or none) | | | |
| Primary | 0.97 (0.84, 1.12) | 0.97 (0.85, 1.12) | 0.97 (0.85, 1.12) |
| Secondary | 0.94 (0.82, 1.08) | 0.95 (0.82, 1.09) | 0.95 (0.82, 1.09) |
| Higher Secondary+ | 0.91 (0.76, 1.08) | 0.91 (0.76, 1.09) | 0.91 (0.76, 1.09) |
| Household Wealth Quintiles (Ref=Poorest) | | | |
| Poorer | 1.07 (0.94, 1.23) | 1.08 (0.94, 1.23) | 1.08 (0.94, 1.23) |
| Middle | 1.14 (1.00, 1.31) * | 1.14 (1.00, 1.31) | 1.14 (1.00, 1.31) |
| Richer | 1.07 (0.93, 1.24) | 1.07 (0.93, 1.23) | 1.07 (0.93, 1.23) |
| Richest | 0.94 (0.79, 1.11) | 0.93 (0.79, 1.10) | 0.93 (0.79, 1.11) |
| Cooking Place (Ref= Main Room) | | | |
| Separate | 1.01 (0.91, 1.12) | 1.01 (0.91, 1.12) | 1.01 (0.91, 1.12) |
| Outdoor | 0.96 (0.85, 1.07) | 0.96 (0.85, 1.07) | 0.96 (0.86, 1.07) |
| Urbanicity (Ref=Rural) | | | |
| Urban | 1.05 (0.93, 1.19) | 1.05 (0.93, 1.19) | 1.05 (0.93, 1.19) |
| Season (Ref= Winter) | | | |
| Summer | 0.97 (0.89, 1.06) | 0.97 (0.89, 1.06) | 0.97 (0.89, 1.06) |
| SFU*Sex | - | **Ref=SFU*Girl** | **Ref= SFU*Boy** |
| | | 1.01 (0.81, 1.27) | 0.99 (0.79, 1.23) |

[a]Prevalence ratios (PRs) were adjusted for child age, ECE, iodine intake, stunting, maternal age, maternal education, household wealth index, cooking place, season, and urbanicity. * p<0.05, ** p<0.01, *** p<0.001.

**Table S6: Association between SFU and socio-emotional stratified by urbanicity**

| **Predictors** | **Overall (Model I)** | **Rural (Model II)** | **Urban (Model III)** |
|---|---|---|---|
| | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** |
| **Unadjusted PRs(*N*=9395)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.22 (1.09, 1.37) ** | 1.33 (1.11,1.60)** | 1.16 (0.97, 1.39) |
| **[a]Adjusted PRs(*N*=9202)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.17 (1.01, 1.36) * | 1.12 (0.93, 1.35) | 1.24 (1.23, 1.24) *** |
| Sex of child | (Ref=Boy) | (Ref=Girl) | (Ref=Girl) |
| | 0.75 (0.69, 0.82) *** | 1.33 (1.23, 1.44) *** | 1.33 (1.33, 1.33) *** |
| Child age (in years) | 0.86 (0.79, 0.94) ** | 0.86 (0.79, 0.94) *** | 0.86 (0.86, 0.86) *** |
| Ever attended ECE Program (Ref=No) | | | |
| Yes | 1.05 (0.94, 1.17) | 1.05 (0.94, 1.18) | 1.05 (1.05, 1.05) *** |
| Iodine Intake (Ref=No) | | | |
| Yes | 1.00 (0.91, 1.10) | 1.00 (0.91, 1.10) | 1.00 (1.00, 1.00) |
| Stunting (Ref=No) | | | |
| Yes | 1.03 (0.94, 1.13) | 1.03 (0.94, 1.13) | 1.03 (1.03, 1.03) *** |
| Maternal Age | 1.00 (0.99, 1.01) | 1.00 (0.99, 1.01) | 1.00 (1.00, 1.00) |
| Maternal Education Level (Ref=Pre-primary or none) | | | |
| Primary | 0.97 (0.84, 1.12) | 0.97 (0.85, 1.12) | 0.97 (0.97, 0.97) *** |
| Secondary | 0.94 (0.82, 1.08) | 0.95 (0.85, 1.09) | 0.94 (0.94, 0.95) *** |
| Higher Secondary+ | 0.91 (0.76, 1.08) | 0.91 (0.76, 1.09) | 0.91 (0.91, 0.91) *** |
| Household Wealth Quintiles (Ref=Poorest) | | | |
| Poorer | 1.07 (0.94, 1.23) | 1.07 (0.94, 1.23) | 1.08 (1.08, 1.08) *** |
| Middle | 1.14 (1.00, 1.31) * | 1.14 (1.00, 1.31) | 1.15 (1.15, 1.15) *** |
| Richer | 1.07 (0.93, 1.24) | 1.07 (0.92, 1.23) | 1.07 (1.07, 1.07) *** |
| Richest | 0.94 (0.79, 1.11) | 0.94 (0.79, 1.11) | 0.94 (0.94, 0.94) *** |
| Cooking Place (Ref=Main Room) | | | |
| Separate | 1.01 (0.91, 1.12) | 1.01 (0.91, 1.12) | 1.01 (1.01, 1.01) *** |
| Outdoor | 0.96 (0.85, 1.07) | 0.96 (0.86, 1.07) | 0.95 (0.95, 0.95) *** |
| Urbanicity (Ref=Rural) | | | |
| Urban | 1.05 (0.93, 1.19) | 0.98 (0.79, 1.22) | 1.02 (1.01, 1.02) *** |
| Season (Ref=Winter) | | | |
| Summer | 0.97 (0.89, 1.06) | 0.98 (0.90, 1.06) | 0.97 (0.97, 0.98) *** |
| SFU*Urbanicity | - | **Ref=SFU*Urban** | **Ref= SFU*Rural** |
| | | 0.91 (0.91, 0.91) *** | 1.11 (0.86, 1.44) |

[a]Prevalence ratios (PRs) were adjusted for child age and sex, ECE, iodine intake, stunting, maternal age, maternal education, household wealth index, cooking place, and season. * p<0.05, ** p<0.01, *** p<0.001.

**Table S7: Association between SFU and literacy-numeracy stratified by sex of the children**

| **Predictors** | **Overall (Model I)** | **Boy (Model II)** | **Girl (Model III)** |
|---|---|---|---|
| | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** |
| **Unadjusted PRs (*N*=9395)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.23 (1.15, 1.31)*** | 1.23 (1.12, 1.34) *** | 1.23 (1.12, 1.36) *** |
| **[a]Adjusted PRs (*N*=9202)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.04 (0.95, 1.13) | 1.04 (0.93, 1.16) *** | 1.03 (0.92, 1.16) |
| Sex of child | (Ref=Boy) | (Ref=Boy) | (Ref=Girl) |
| | 0.96 (0.92, 1.01) | 0.97 (0.86, 1.09) | 1.03 (0.91, 1.17) |
| Child age (in years) | 0.77 (0.73, 0.81) *** | 0.77 (0.73, 0.81) *** | 0.77 (0.73, 0.81) *** |
| Ever attended ECE Program (Ref=No) | | | |
| Yes | 0.61 (0.56, 0.66) *** | 0.61 (0.56, 0.66) *** | 0.61 (0.56, 0.66) *** |
| Iodine Intake (Ref=No) | | | |
| Yes | 0.95 (0.90, 1.01) | 0.95 (0.90, 1.01) | 0.95 (0.90, 1.01) |
| Stunting (Ref=No) | | | |
| Yes | 1.08 (1.03, 1.14) ** | 1.08 (1.03, 1.14) * | 1.08 (1.03, 1.14) ** |
| Maternal Age | 1.00 (1.00, 1.01) | 1.00 (1.00, 1.01) | 1.00 (1.00, 1.01) |
| Maternal Education Level (Ref=Pre-primary or none) | | | |
| Primary | 0.97 (0.90, 1.05) | 0.97 (0.90, 1.05) | 0.97 (0.90, 1.05) |
| Secondary | 0.88 (0.81, 0.95) ** | 0.87 (0.81, 0.95) ** | 0.87 (0.81, 0.95) ** |
| Higher Secondary+ | 0.75 (0.67, 0.83) *** | 0.75 (0.67, 0.83) *** | 0.75 (0.67, 0.83) *** |
| Household Wealth Quintiles (Ref=Poorest) | | | |
| Poorer | 0.97 (0.90, 1.05) | 0.97 (0.90, 1.05) | 0.97 (0.90, 1.05) |
| Middle | 0.94 (0.87, 1.02) | 0.94 (0.87, 1.02) | 0.94 (0.87, 1.02) |
| Richer | 0.90 (0.83, 0.98) * | 0.90 (0.83, 0.98) * | 0.90 (0.83, 0.98) * |
| Richest | 0.84 (0.76, 0.93) ** | 0.84 (0.76, 0.93) ** | 0.84 (0.76, 0.93) ** |
| Cooking Place (Ref= Main Room) | | | |
| Separate | 1.00 (0.94, 1.06) | 1.00 (0.94, 1.06) | 1.00 (0.94, 1.06) |
| Outdoor | 0.99 (0.92, 1.06) | 0.99 (0.92, 1.06) | 0.99 (0.92, 1.06) |
| Urbanicity (Ref=Rural) | | | |
| Urban | 1.03 (0.96, 1.11) | 1.03 (0.96, 1.11) | 1.03 (0.96, 1.11) |
| Season (Ref= Winter) | | | |
| Summer | 1.02(0.97, 1.07) | 1.02 (0.97, 1.07) | 1.02 (0.97, 1.07) |
| SFU*Sex | - | **Ref=SFU*Girl** | **Ref= SFU*Boy** |
| | | 1.01 (0.88, 1.15) | 0.99 (0.87, 1.13) |

[a]Prevalence ratios (PRs) were adjusted for child age, ECE, iodine intake, stunting, maternal age, maternal education, household wealth index, cooking place, season, and urbanicity. * p<0.05, ** p<0.01, *** p<0.001.

**Table S8: Association between SFU and literacy-numeracy stratified by urbanicity**

| Predictors | Overall (Model I) | Rural (Model II) | Urban (Model III) |
|---|---|---|---|
| | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** |
| **Unadjusted PRs (*N*=9395)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.23 (1.15, 1.31)*** | 1.22 (1.09, 1.36)*** | 1.23 (1.10, 1.36)*** |
| **[a]Adjusted PRs (*N*=9202)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.04 (0.95, 1.13) | 1.04 (0.93, 1.17) | 1.03 (0.91, 1.16) |
| Sex of child | (Ref=Boy) | (Ref=Girl) | (Ref=Girl) |
| | 0.96 (0.92, 1.01) | 1.04 (0.99, 1.09) | 1.04 (0.99, 1.09) |
| Child age (in years) | 0.77 (0.73, 0.81) *** | 0.77 (0.73, 0.81) *** | 0.77 (0.73, 0.81) *** |
| Ever attended ECE Program (Ref=No) | | | |
| Yes | 0.61 (0.56, 0.66) *** | 0.61 (0.56, 0.66) *** | 0.61 (0.56, 0.66) *** |
| Iodine Intake (Ref=No) | | | |
| Yes | 0.95 (0.90, 1.01) | 0.95 (0.90, 1.01) | 0.95 (0.90, 1.01) |
| Stunting (Ref=No) | | | |
| Yes | 1.08 (1.03, 1.14) ** | 1.08 (1.03, 1.14) ** | 1.08 (1.03, 1.14) ** |
| Maternal Age | 1.00 (1.00, 1.01) | 1.00 (1.00, 1.01) | 1.00 (1.00, 1.01) |
| Maternal Education Level (Ref=Pre-primary or none) | | | |
| Primary | 0.97 (0.90, 1.05) | 0.97 (0.90, 1.05) | 0.97 (0.90, 1.05) |
| Secondary | 0.88 (0.81, 0.95) ** | 0.88 (0.81, 0.95) ** | 0.88 (0.81, 0.95) ** |
| Higher Secondary+ | 0.75 (0.67, 0.83) *** | 0.75 (0.67, 0.83) *** | 0.75 (0.67, 0.83) *** |
| Household Wealth Quintiles (Ref=Poorest) | | | |
| Poorer | 0.97 (0.90, 1.05) | 0.97 (0.90, 1.05) | 0.97 (0.90, 1.05) |
| Middle | 0.94 (0.87, 1.02) | 0.94 (0.87, 1.02) | 0.94 (0.87, 1.02) |
| Richer | 0.90 (0.83, 0.98) * | 0.90 (0.83, 0.98) * | 0.90 (0.83, 0.98) * |
| Richest | 0.84 (0.76, 0.93) ** | 0.84 (0.76, 0.93) ** | 0.84 (0.76, 0.93) ** |
| Cooking Place (Ref= Main Room) | | | |
| Separate | 1.00 (0.94, 1.06) | 1.00 (0.94, 1.06) | 1.00 (0.94, 1.06) |
| Outdoor | 0.99 (0.92, 1.06) | 0.99 (0.92, 1.06) | 0.99 (0.92, 1.06) |
| Urbanicity (Ref=Rural) | | | |
| Urban | 1.03 (0.96, 1.11) | 1.04 (0.91, 1.18) | 0.96 (0.85-1.10) |
| Season (Ref= Winter) | | | |
| Summer | 1.02(0.97, 1.07) | 1.02 (0.97, 1.07) | 1.02 (0.97, 1.07) |
| SFU*Urbanicity | - | **Ref=SFU*Urban** | **Ref= SFU*Rural** |
| | | 1.01 (0.87, 1.18) | 0.99 (0.85, 1.15) |

[a]Prevalence ratios (PRs) were adjusted for child age, ECE, iodine intake, stunting, maternal age, maternal education, household wealth index, cooking place, and season. * p<0.05, ** p<0.01, *** p<0.001.



Rana J, *et al. J Epidemiol Community Health* 2022; 76:667–676. doi: 10.1136/jech-2021-217554

**Table S9: Association between SFU and physical development stratified by sex of the children**

| **Predictors** | **Overall (Model I)** | **Boy (Model II)** | **Girl (Model III)** |
|---|---|---|---|
| | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** |
| **Unadjusted PRs(*N*=9395)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.58 (0.48, 5.20) | 1.10 (0.26, 4.55) | 3.07 (0.31, 30.84) |
| **[a]Adjusted PRs (*N*=9202)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 0.71 (0.32, 1.60) | 0.34 (0.13, 0.88) * | 2.23 (0.65, 7.66) |
| Sex of child | (Ref=Boy) | (Ref=Boy) | (Ref=Girl) |
| | 0.69 (0.45, 1.05) | 0.39 (0.13, 1.19) | 2.41 (0.69, 8.39) |
| Child age (in years) | 0.53 (0.34, 0.84) ** | 0.77 (0.50, 1.19) | 0.62 (0.40, 0.97) * |
| Ever attended ECE Program (Ref=No) | | | |
| Yes | 1.12 (0.62, 2.02) | 0.97 (0.55, 1.73) | 0.92 (0.50, 1.70) |
| Iodine Intake (Ref=No) | | | |
| Yes | 0.55 (0.34, 0.90) * | 0.60 (0.37, 0.98) * | 0.64 (0.40, 1.05) |
| Stunting (Ref=No) | | | |
| Yes | 0.75 (0.46, 1.21) | 0.70 (0.44, 1.14) | 0.76 (0.47, 1.22) |
| Maternal Age | 0.96 (0.93, 1.00) * | 0.94 (0.91, 0.98) ** | 0.98 (0.94, 1.02) |
| Maternal Education Level (Ref=Pre-primary or none) | | | |
| Primary | 0.56 (0.30, 1.05) | 0.59 (0.31, 1.12) | 0.58 (0.31, 1.09) |
| Secondary | 0.30 (0.15, 0.59) *** | 0.38 (0.19, 0.75) ** | 0.39 (0.20, 0.77) ** |
| Higher Secondary+ | 0.49 (0.20, 1.17) | 0.78 (0.33, 1.87) | 0.48 (0.19, 1.21) |
| Household Wealth Quintiles (Ref=Poorest) | | | |
| Poorer | 1.22 (0.61, 2.43) | 0.87 (0.46, 1.66) | 0.95 (0.49, 1.86) |
| Middle | 1.24 (0.61, 2.50) | 0.76 (0.39, 1.47) | 0.86 (0.43, 1.73) |
| Richer | 1.14 (0.50, 2.60) | 0.55 (0.24, 1.22) | 0.92 (0.41, 2.05) |
| Richest | 1.09 (0.41, 2.92) | 0.44 (0.16, 1.17) | 1.00 (0.38, 2.59) |
| Cooking Place (Ref=Main Room) | | | |
| Separate | 1.08 (0.62, 1.88) | 1.11 (0.64, 1.93) | 0.73 (0.42, 1.26) |
| Outdoor | 0.79 (0.43, 1.45) | 0.78 (0.43, 1.43) | 0.61 (0.34, 1.10) |
| Urbanicity (Ref=Rural) | | | |
| Urban | 0.73 (0.31, 1.72) | 0.47 (0.18, 1.22) | 0.44 (0.16, 1.27) |
| Season (Ref=Winter) | | | |
| Summer | 1.15 (0.64, 2.07) | 1.22 (0.69, 2.16) | 1.46 (0.79, 2.67) |
| SFU*Sex | - | **Ref=SFU*Girl** | **Ref= SFU*Boy** |
| | | 0.43 (0.11,1.60) | 2.77 (0.84,9.17) |

[a]Prevalence ratios (PRs) were adjusted for child age, ECE, iodine intake, stunting, maternal age, maternal education, household wealth index, cooking place, season, and urbanicity. * p<0.05, ** p<0.01, *** p<0.001.)

**Table S10: Association between SFU and physical development stratified by urbanicity**

| **Predictors** | **Overall (Model I)** | **Rural (Model II)** | **Urban (Model III)** |
|---|---|---|---|
| | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** | **Prevalence Ratios (95 % CI)** |
| **Unadjusted PRs (*N*=9395)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 1.58 (0.48, 5.20) | 1.38 (0.22, 8.41) | 1.67 (0.24, 11.74) |
| [a]**Adjusted PRs (*N*=9202)** | | | |
| Solid Fuel Use (SFU) | | | |
| Exposed vs Unexposed | 0.71 (0.32, 1.60) | 0.75 (0.30, 1.91) | 0.94 (0.28, 3.19) |
| Sex of child | (Ref=Boy) | (Ref=Girl) | (Ref=Girl) |
| | 0.69 (0.45, 1.05) * | 0.71 (0.47, 1.09) | 0.99 (0.66, 1.48) |
| Child age (in years) | 0.53 (0.34, 0.84) *** | 0.57 (0.37, 0.89) * | 1.10 (0.72, 1.66) |
| Ever attended ECE Program (Ref=No) | | | |
| Yes | 1.12 (0.62, 2.02) | 1.08 (0.60, 1.93) | 0.64 (0.36, 1.16) |
| Iodine Intake (Ref=No) | | | |
| Yes | 0.55 (0.34, 0.90) ** | 0.43 (0.27, 0.69) ** | 0.72 (0.45, 1.15) |
| Stunting (Ref=No) | | | |
| Yes | 0.75 (0.46, 1.21) | 0.64 (0.39, 1.04) | 0.63 (0.39, 1.01) |
| Maternal Age | 0.96 (0.93, 1.00) ** | 0.94 (0.91, 0.98) ** | 0.98 (0.94, 1.02) |
| Maternal Education Level (Ref=Pre-primary or none) | | | |
| Primary | 0.56 (0.30, 1.05) | 0.45 (0.24, 0.83) * | 0.86 (0.46, 1.61) |
| Secondary | 0.30 (0.15, 0.59) *** | 0.23 (0.12, 0.45) *** | 0.68 (0.35, 1.32) |
| Higher Secondary+ | 0.49 (0.20, 1.17) | 0.51 (0.22, 1.19) | 1.17 (0.49, 2.80) |
| Household Wealth Quintiles (Ref=Poorest) | | | |
| Poorer | 1.22 (0.61, 2.43) | 1.05 (0.55, 2.01) | 0.63 (0.35, 1.15) |
| Middle | 1.24 (0.61, 2.50) | 0.87 (0.44, 1.74) | 0.43 (0.22, 0.82) * |
| Richer | 1.14 (0.50, 2.60) | 1.00 (0.46, 2.19) | 0.29 (0.13, 0.64) ** |
| Richest | 1.09 (0.41, 2.92) * | 0.79 (0.30, 2.07) | 0.29 (0.33, 0.75) * |
| Cooking Place (Ref= Main Room) | | | |
| Separate | 1.08 (0.62, 1.88) | 0.97 (0.57, 1.67) | 0.94 (0.56, 1.59) |
| Outdoor | 0.79 (0.43, 1.45) | 0.71 (0.39, 1.29) | 0.63 (0.35, 1.13) |
| Urbanicity (Ref=Rural) | | | |
| Urban | 0.73 (0.31, 1.72) | 0.66 (0.20, 2.24) | 0.54 (0.14, 2.15) |
| Season (Ref= Winter) | | | |
| Summer | 1.15 (0.64, 2.07) | 1.28 (0.75, 2.20) | 1.24 (0.73, 2.11) |
| SFU*Urbanicity | - | **Ref=SFU*Urban** | **Ref= SFU*Rural** |
| | | 1.60 (0.33,7.73) | 0.91 (0.19,4.22) |

[a]Prevalence ratios (PRs) were adjusted for child age, sex, ECE, iodine intake, stunting, maternal age, maternal education, household wealth index, cooking place, and season. * p<0.05, ** p<0.01, *** p<0.001.)

**Table S11: Levels of HAP Exposure and ECD Outcomes by Sex of the Children**

| ECD Outcomes | Levels of HAP Exposure | Sex | Unadjusted PRs *N*=9395 (95% CI) | P-value | Adjusted PRs *N*=9202 (95% CI)[a] | P-value/ P-int | P-trend |
|---|---|---|---|---|---|---|---|
| ECDI | Moderately Exposed vs. Unexposed | All | 1.64 (1.44, 1.87) | <0.001 | 1.39, (1.18, 1.63) | <0.001 | <0.001 |
| ECDI | Highly Exposed vs. Unexposed | All | 1.72 (1.48, 2.00) | <0.001 | 1.47, (1.24, 1.75) | <0.001 | |
| ECDI | Moderately Exposed vs. Unexposed | Boys | 1.52 (1.29, 1.79) | <0.001 | 1.30 (1.08, 1.57) | P-int >0.05 | 0.039 |
| ECDI | Highly Exposed vs. Unexposed | Boys | 1.54 (1.27, 1.86) | <0.001 | 1.33 (1.08, 1.65) | | |
| ECDI | Moderately Exposed vs. Unexposed | Girls | 1.88 (1.52, 2.33) | <0.001 | 1.54 (1.22, 1.94) | P-int >0.05 | <0.001 |
| ECDI | Highly Exposed vs. Unexposed | Girls | 2.08 (1.64, 2.64) | <0.001 | 1.71 (1.32, 2.20) | | |
| Learning-Cognition | Moderately Exposed vs. Unexposed | All | 1.84 (1.40, 2.44) | <0.001 | 1.59 (1.16, 2.16) | 0.004 | <0.001 |
| Learning-Cognition | Highly Exposed vs. Unexposed | All | 2.41 (1.77, 3.29) | <0.001 | 1.97 (1.42, 2.74) | <0.001 | |
| Learning-Cognition | Moderately Exposed vs. Unexposed | Boys | 2.95 (2.94, 2.95) | <0.001 | 1.70 (1.16, 2.48) | P-int >0.05 | 0.001 |
| Learning-Cognition | Highly Exposed vs. Unexposed | Boys | 3.63 (3.63, 3.64) | <0.001 | 1.96 (1.31, 2.95) | | |
| Learning-Cognition | Moderately Exposed vs. Unexposed | Girls | 1.97 (1.30, 3.00) | 0.001 | 1.67 (1.10, 2.55) | P-int >0.05 | <0.001 |
| Learning-Cognition | Highly Exposed vs. Unexposed | Girls | 2.85 (1.81, 4.50) | <0.001 | 2.31 (1.48, 3.60) | | |
| Socio-emotional Development | Moderately Exposed vs. Unexposed | All | 1.25 (1.11, 1.40) | <0.001 | 1.20 (1.04, 1.39) | 0.015 | 0.760 |
| Socio-emotional Development | Moderately Exposed vs. Unexposed | All | 1.14 (0.99, 1.31) | 0.068 | 1.10 (0.93, 1.29) | 0.259 | |
| Socio-emotional Development | Moderately Exposed vs. Unexposed | Boys | 1.24 (1.07, 1.44) | 0.004 | 1.19 (1.00, 1.42) | P-int >0.05 | 0.661 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Socio-emotional Development | Highly Exposed vs. Unexposed | Boys | 1.16 (0.97, 1.38) | 0.115 | 1.11 (0.91, 1.35) | | |
| Socio-emotional Development | Highly Exposed vs. Unexposed | Girls | 1.26 (1.06, 1.50) | 0.010 | 1.19 (0.98, 1.46) | P-int >0.05 | 0.967 |
| Socio-emotional Development | Highly Exposed vs. Unexposed | Girls | 1.13 (0.91, 1.40) | 0.262 | 1.07 (0.84, 1.36) | | |
| Literacy-Numeracy | Moderately Exposed vs. Unexposed | All | 1.23 (1.15, 1.32) | <0.001 | 1.03 (0.95, 1.13) | 0.456 | 0.588 |
| Literacy-Numeracy | Highly Exposed vs. Unexposed | All | 1.23 (1.13, 1.33) | <0.001 | 1.03 (0.94, 1.14) | 0.494 | |
| Literacy-Numeracy | Moderately Exposed vs. Unexposed | Boys | 1.23 (1.12, 1.35) | <0.001 | 1.04 (0.93, 1.16) | P-int >0.05 | 0.764 |
| Literacy-Numeracy | Highly Exposed vs. Unexposed | Boys | 1.22 (1.09, 1.37) | <0.001 | 1.03 (0.91, 1.16) | | |
| Literacy-Numeracy | Moderately Exposed vs. Unexposed | Girls | 1.23 (1.12, 1.36) | <0.001 | 1.03 (0.92, 1.15) | P-int >0.05 | 0.605 |
| Literacy-Numeracy | Highly Exposed vs. Unexposed | Girls | 1.23 (1.10, 1.39) | <0.001 | 1.04 (0.91, 1.19) | | |
| Physical Development | Moderately Exposed vs. Unexposed | All | 1.58 (0.47, 5.33) | 0.461 | 0.62 (0.19, 2.02) | 0.428 | 0.519 |
| Physical Development | Highly Exposed vs. Unexposed | All | 1.56 (0.38, 6.49) | 0.539 | 0.48 (0.12, 1.85) | 0.284 | |
| Physical Development | Moderately Exposed vs. Unexposed | Boys | 1.18 (0.27, 5.11) | 0.825 | 2.93 (0.24, 36.44) | P-int >0.05 | 0.910 |
| Physical Development | Highly Exposed vs. Unexposed | Boys | 0.83 (0.12, 5.74) | 0.847 | 6.93 (0.49, 96.98) | | |
| Physical Development | Moderately Exposed vs. Unexposed | Girls | 2.87 (0.29, 28.72) | 0.371 | 0.24 (0.04, 1.37) | P-int >0.05 | 0.776 |
| Physical Development | Highly Exposed vs. Unexposed | Girls | 3.85 (0.33, 45.07) | 0.282 | 0.71 (0.12, 4.15) | | |

[a]Prevalence ratios (PRs) were adjusted for child age, ECE, iodine intake, stunting, maternal age, maternal education, household wealth index, urbanicity, and season. CI-Confidence Intervals; * p<0.05, ** p<0.01, *** p<0.001.

**Table S12: Levels of HAP Exposure and ECD Outcomes by Urbanicity**

| ECD Outcomes | Levels of HAP Exposure | Urbanicity | Unadjusted PRs *N*=9395 (95% CI) | P-value | Adjusted PRs *N*=9202 (95% CI) [a] | P-value/ P-int | P-trend |
|---|---|---|---|---|---|---|---|
| ECDI | Moderately Exposed vs. Unexposed | All | 1.64 (1.44, 1.87) | <0.001 | 1.39 (1.18, 1.63) | <0.001 | <0.001 |
| ECDI | Highly Exposed vs. Unexposed | All | 1.72 (1.48, 2.00) | <0.001 | 1.47 (1.24, 1.75) | <0.001 | |
| ECDI | Moderately Exposed vs. Unexposed | Rural | 1.60 (1.29, 1.97) | <0.001 | 1.32 (1.06, 1.63) | P-int >0.05 | 0.011 |
| ECDI | Highly Exposed vs. Unexposed | Rural | 1.68 (1.34, 2.37) | <0.001 | 1.41 (1.12, 1.77) | | |
| ECDI | Moderately Exposed vs. Unexposed | Urban | 1.81 (1.46, 2.25) | <0.001 | 1.48 (1.18, 1.86) | P-int >0.05 | 0.002 |
| ECDI | Highly Exposed vs. Unexposed | Urban | 1.78 (1.34, 2.37) | <0.001 | 1.48 (1.11, 1.99) | | |
| Learning-Cognition | Moderately Exposed vs. Unexposed | All | 1.84 (1.40, 2.44) | <0.001 | 1.59 (1.16, 2.16) | 0.004 | <0.001 |
| Learning-Cognition | Highly Exposed vs. Unexposed | All | 2.41 (1.77, 3.29) | <0.001 | 1.97 (1.42, 2.4) | <0.001 | |
| Learning-Cognition | Moderately Exposed vs. Unexposed | Rural | 1.78 (1.19, 2.66) | 0.005 | 1.49 (0.98, 2.25) | P-int >0.05 | 0.003 |
| Learning-Cognition | Highly Exposed vs. Unexposed | Rural | 2.22 (1.46, 3.39) | <0.001 | 1.85 (1.20, 2.85) | | |
| Learning-Cognition | Moderately Exposed vs. Unexposed | Urban | 2.14 (1.36, 3.36) | 0.001 | 1.82 (1.17, 2.84) | P-int >0.05 | 0.001 |
| Learning-Cognition | Highly Exposed vs. Unexposed | Urban | 2.78 (1.60, 4.83) | <0.001 | 2.37 (1.42, 3.94) | | |
| Socio-emotional Development | Moderately Exposed vs. Unexposed | All | 1.25 (1.11, 1.40) | <0.001 | 1.20 (1.04, 1.39) | 0.015 | 0.760 |
| Socio-emotional Development | Moderately Exposed vs. Unexposed | All | 1.14 (0.99, 1.31) | 0.068 | 1.10 (0.93, 1.29) | 0.259 | |
| Socio-emotional Development | Moderately Exposed vs. Unexposed | Rural | 1.18 (0.99, 1.41) | 0.0065 | 1.14 (0.94, 1.37) | P-int >0.05 | 0.757 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Socio-emotional Development | Highly Exposed vs. Unexposed | Rural | 1.10 (0.90, 1.34) | 0.360 | 1.05 (0.86, 1.29) | | |
| Socio-emotional Development | Highly Exposed vs. Unexposed | Urban | 1.40 (1.15, 1.71) | 0.001 | 1.30 (1.05, 1.60) | P-int >0.05 | 0.237 |
| Socio-emotional Development | Highly Exposed vs. Unexposed | Urban | 1.16 (0.86, 1.32) | 0.558 | 1.09 (0.81, 1.47) | | |
| Literacy-Numeracy | Moderately Exposed vs. Unexposed | All | 1.23 (1.15, 1.32) | <0.001 | 1.03 (0.95, 1.13) | 0.456 | 0.588 |
| Literacy-Numeracy | Highly Exposed vs. Unexposed | All | 1.23 (1.13, 1.33) | <0.001 | 1.03 (0.94, 1.14) | 0.494 | |
| Literacy-Numeracy | Moderately Exposed vs. Unexposed | Rural | 1.23 (1.10, 1.37) | <0.001 | 1.04 (0.93, 1.17) | P-int >0.05 | 0.772 |
| Literacy-Numeracy | Highly Exposed vs. Unexposed | Rural | 1.22 (1.08, 1.37) | 0.001 | 1.03 (0.91, 1.17) | | |
| Literacy-Numeracy | Moderately Exposed vs. Unexposed | Urban | 1.20 (1.06, 1.36) | 0.003 | 1.01 (0.89, 1.26) | P-int >0.05 | 0.565 |
| Literacy-Numeracy | Highly Exposed vs. Unexposed | Urban | 1.25 (1.06, 1.47) | 0.007 | 1.06 (0.89, 1.26) | | |
| Physical Development | Moderately Exposed vs. Unexposed | All | 1.58 (0.47, 5.33) | 0.461 | 0.62 (0.19, 2.02) | 0.428 | 0.519 |
| Physical Development | Highly Exposed vs. Unexposed | All | 1.56 (0.38, 6.49) | 0.539 | 0.48 (0.12, 1.85) | 0.284 | |
| Physical Development | Moderately Exposed vs. Unexposed | Rural | 1.39 (0.22, 8.64) | 0.722 | 1.23 (0.44, 3.44) | P-int >0.05 | 0.855 |
| Physical Development | Highly Exposed vs. Unexposed | Rural | 1.32 (0.18, 9.74) | 0.788 | 0.97 (0.31, 3.01) | | |
| Physical Development | Moderately Exposed vs. Unexposed | Urban | 1.51(0.17, 13.38) | 0.713 | 0.58 (0.14, 2.42) | P-int >0.05 | 0.493 |
| Physical Development | Highly Exposed vs. Unexposed | Urban | 2.05(0.15, 12.14) | 0.847 | 0.70 (0.11, 4.27) | | |

[a]Prevalence ratios (PRs) were adjusted for child age, sex, ECE, iodine intake, stunting, maternal age, maternal education, household wealth index, and season.
CI-Confidence Intervals; * p<0.05, ** p<0.01, *** p<0.001.