Effect of water, sanitation and hygiene interventions on pathogens in the environment: Individual participant data meta-analysis

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# Supplementary Tables

## Table S1. Systematic review search terms

Search terms were combined with “OR” within columns and with “AND” across columns.

| **Study design** | **WASH** | **Environmental markers** | **Child health** |
| --- | --- | --- | --- |
| matched, trial, RCT, experiment, intervention, randomized, randomised, quasi-randomized, quasi-randomised, quasi-experimental, pseudo-randomized, pseudo-randomised, non-randomized controlled trials | Water, Sanitation, Hygiene, Handwashing, WSH, Sanitation, Water Supply, Sanitary Drainage, Toilet Facilities, Drinking Water, Hand Hygiene, Water Purification, Waste Water, disinfection | molecular source tracking, microbial source tracking, microbial transmission, diarrheal pathogen, diarrheal pathogens, diarrhoeal pathogen, diarrhoeal pathogens, fecal-oral, faecal-oral, entericpathogen, entericpathogens, ruminant, avian, Feces, Faeces, Fecal, Faecal, Fecally, Faecally | Entericinfection, Soil-transmitted helminth, Protozoan, Seroconversion, Fecal microbiology, Faecal microbiology, Fecal biomarker, Faecal biomarker, Intestinal Diseases, Parasitic, Seroconversion, Enteritis, Helminthiasis, Helminthiases, Intestinal infection, Viral infection, Bacterial infection, Parasite infection, Parasitic infection, Helminth infection, Fecal sampling, Faecal sampling, Stool sampling, Stool collection, Diarrhea, Dysentery, Child growth faltering, Growth faltering, Child development, Length-for-age, Height-for-age, Weight-for-age, Head circumference, Waist circumference, Stunting, Stunted, Wasting, Wasted, Linear growth, Anthropometric measurement, Malnutrition, Undernourished, Undernutrition, Underweight, Growth Disorders, Childnutrition disorder, Wasting syndrome, Thinness, Growth velocity |

## Table S2. Pubmed search string

[MH] are mesh headers and [TW] are text words.

|  |
| --- |
| ((matched [tw]) OR (trial [tw]) OR (RCT [tw]) OR (experiment [tw]) OR (intervention [tw]) OR (randomized [tw]) OR (randomised [tw]) OR (quasi-randomized [tw]) OR (quasi-randomised [tw]) OR (quasi-experimental [tw]) OR (pseudo-randomized [tw]) OR (pseudo-randomised [tw]) OR (“non-randomized controlled trials as topic” [mh])) AND ((Water [tw]) OR (Sanitation [tw]) OR (Hygiene [tw]) OR (Handwashing [tw]) OR (WSH [tw]) OR (“Sanitation” [mh]) OR (“Water Supply” [mh]) OR (“Drainage, Sanitary” [mh]) OR (Sanitary Drainage [tw]) OR (“Toilet Facilities” [mh]) OR (“Drinking Water” [mh]) OR (“Hand Hygiene” [mh]) OR (“Water Purification” [mh]) OR (“Waste Water” [mh]) OR (disinfect\* [tw])) AND ((molecular source tracking [tw]) OR (microbial source tracking [tw]) OR (microbial transmission [tw]) OR (diarrheal pathogen [tw]) OR (diarrheal pathogens [tw]) OR (diarrhoeal pathogen [tw]) OR (diarrhoeal pathogens [tw]) OR (fecal-oral [tw]) OR (faecal-oral [tw]) OR (enteric pathogen [tw]) OR (enteric pathogens [tw]) OR (ruminant\* [tw]) OR (avian\* [tw]) OR (“Feces” [mh]) OR (Feces [tw]) OR (Faeces [tw]) OR (Fecal [tw]) OR (Faecal [tw]) OR (Fecally [tw]) OR (Faecally [tw])) AND (((Enteric infection\* [tw]) OR (Soil-transmitted helminth\* [tw]) OR (Protozoan\* [tw]) OR (Seroconversion [tw]) OR (Fecal microbio\* [tw]) OR (Faecal microbio\* [tw]) OR (Fecal biomarker\* [tw]) OR (Faecal biomarker\* [tw]) OR (“Intestinal Diseases, Parasitic/epidemiology” [mh]) OR (“Seroconversion” [mh]) OR (Seroconversion [tw]) OR (“Enteritis/epidemiology” [mh]) OR (“Helminthiasis/complications” [mh]) OR (Helminthiasis [tw]) OR (Helminthiases)OR (“Helminthiasis/epidemiology” [mh]) OR (“Helminthiasis/prevention and control” [mh]) OR (Intestinal infection\* [tw]) OR (Viral infection\* [tw]) OR (Bacterial infection\* [tw]) OR (Parasite infection\* [tw]) OR (Parasitic infection\* [tw]) OR (Helminth infection\* [tw]) OR (Fecal sampling [tw]) OR (Faecal sampling [tw]) OR (Bacterial infection\* [tw]) OR (Parasite infection\* [tw]) OR (Parasitic infection\* [tw]) OR (Helminth infection\* [tw]) OR (Fecal sampling [tw]) OR (Faecal sampling [tw]) OR (Stool sampling [tw]) OR (Stool collection [tw])) OR ((Diarrh\* [tw]) OR (Dysentery [tw]) OR (“Diarrhea/epidemiology” [mh]) OR (“Diarrhea/etiology” [mh]) OR (“Diarrhea/prevention and control” [mh]) OR (“Diarrhea, Infantile” [mh]) OR (“Dysentery” [mh])) OR (Child growth faltering [tw]) OR (Growth faltering [tw])OR (Child development [tw]) OR (Length-for-age [tw]) OR (Height-for-age [tw]) OR (Weight-for-age [tw]) OR (Head circumference [tw]) OR (Waist circumference [tw]) OR (Stunt\* [tw]) OR (Wasting [tw]) OR (Wasted [tw]) OR (Linear growth [tw]) OR (Anthropometric measurement\* [tw]) OR (Maln\* [tw]) OR (Undernourish\* [tw]) OR (Undernutrition [tw]) OR (Underweight [tw]) OR (“Growth Disorders” [mh]) OR (Growth Disorders [tw]) OR (“Child nutrition disorders” [mh]) OR (Child nutrition disorder\* [tw]) OR (“Malnutrition” [mh]) OR (“Wasting Syndrome” [mh]) OR (Wasting syndrome [tw]) OR (“Thinness” [mh]) OR (Thinness [tw]) OR (Growth velocity [tw])) |

## Table S3. PRISMA Checklist

(See separate attachment)

## Table S4. Prevalence of pathogens by sample type tested in each study

| **Study** | **Sample** | **Target** | **Percent positive (n/N)** | **PR (95% CI)** |
| --- | --- | --- | --- | --- |
| Odagiri 2016 | Source water | V. cholerae | 31.7% (19/60) | 0.73 (0.34, 1.57) |
| - | - | Adenovirus | 8.3% (5/60) | 0.25 (0.03, 2.19) |
| - | - | Rotavirus | 23.3% (14/60) | 0.75 (0.29, 1.93) |
| Boehm 2016 | Stored water | Rotavirus | 0.6% (3/493) | - |
| - | Child hands | Rotavirus | 6.1% (30/493) | 1.13 (0.52, 2.44) |
| - | House soil | Rotavirus | 1.4% (7/496) | 2.52 (0.51, 12.42) |
| Reese 2017 | Source water | Shigella | 10.7% (161/1499) | 0.73 (0.46, 1.15) |
| - | - | V. cholerae | 13% (36/276) | 0.93 (0.46, 1.85) |
| - | Stored water | Shigella | 10.1% (190/1874) | 1.08 (0.77, 1.51) |
| - | - | V. cholerae | 23.7% (100/422) | 1.03 (0.66, 1.6) |
| Steinbaum 2019 | House soil | Ascaris | 13% (273/2107) | 0.88 (0.68, 1.14) |
| - | - | Trichuris | 6.9% (146/2107) | 0.86 (0.6, 1.23) |
| Fuhrmeister 2020 | Stored water | Pathogenic E. coli | 38.6% (286/741) | 1 (0.84, 1.19) |
| - | Child hands | Pathogenic E. coli | 34% (127/373) | 1.02 (0.78, 1.35) |
| - | - | Giardia | 4.8% (15/311) | 0.89 (0.33, 2.38) |
| - | - | Norovirus | 4.2% (14/337) | 0.99 (0.37, 2.69) |
| - | Mother's hands | Pathogenic E. coli | 24% (177/737) | 0.85 (0.67, 1.09) |
| - | - | Giardia | 2.3% (14/602) | 0.56 (0.14, 2.13) |
| - | - | Norovirus | 3.1% (21/684) | 1.06 (0.45, 2.46) |
| - | House soil | Pathogenic E. coli | 61.3% (453/739) | 0.94 (0.84, 1.06) |
| Capone 2021 | Latrine soil | C. difficile | 14.8% (13/88) | 0.9 (0.32, 2.48) |
| - | - | Campylobacter | 6.8% (6/88) | 2.09 (0.4, 11.05) |
| - | - | Pathogenic E. coli | 56.8% (50/88) | 0.89 (0.56, 1.42) |
| - | - | Salmonella | 6.8% (6/88) | 0.52 (0.1, 2.76) |
| - | - | Shigella | 21.6% (19/88) | 0.28 (0.1, 0.78) |
| - | - | V. cholerae | 0% (0/88) | - |
| - | - | Yersinia | 4.5% (4/88) | - |
| - | - | Ascaris | 60.2% (53/88) | 0.65 (0.41, 1.02) |
| - | - | Trichuris | 17% (15/88) | 0.92 (0.36, 2.33) |
| - | - | Cryptosporidium | 8% (7/88) | 0.78 (0.18, 3.36) |
| - | - | Entamoeba histolytica | 1.1% (1/88) | - |
| - | - | Giardia | 31.8% (28/88) | 0.47 (0.21, 1.07) |
| - | - | Adenovirus | 20.5% (18/88) | 0.21 (0.06, 0.68) |
| - | - | Astrovirus | 29.5% (26/88) | 1.27 (0.67, 2.43) |
| - | - | Norovirus | 2.3% (2/88) | - |
| - | - | Rotavirus | 4.5% (4/88) | - |
| - | - | Sapovirus | 0% (0/88) | - |
| Kwong 2021 | House soil | Ascaris | 62.3% (886/1423) | 0.97 (0.87, 1.07) |
| - | - | Trichuris | 56.1% (798/1423) | 1.02 (0.91, 1.15) |

## Table S5. Prevalence of microbial source tracking markers by sample type tested in each study

| **Study** | **Sample** | **Target** | **Percent positive (n/N)** | **PR (95% CI)** |
| --- | --- | --- | --- | --- |
| Odagiri 2016 | Source water | Animal (BacCow) | 91.7% (55/60) | 1.04 (0.89, 1.21) |
| - | - | Human (BacHum) | 71.7% (43/60) | 1.05 (0.76, 1.45) |
| Boehm 2016 | Stored water | Avian (GFD) | 9.3% (46/493) | 0.71 (0.37, 1.36) |
| - | - | Ruminant (BacR) | 21.9% (108/493) | 0.62 (0.43, 0.9) |
| - | - | Human (HumM2) | 0% (0/493) | - |
| - | Child hands | Avian (GFD) | 16.2% (80/493) | 1.03 (0.65, 1.64) |
| - | - | Ruminant (BacR) | 54.2% (267/493) | 0.95 (0.8, 1.13) |
| - | - | Human (HumM2) | 2.4% (12/493) | 1.39 (0.46, 4.2) |
| - | House soil | Avian (GFD) | 33.3% (165/496) | 0.98 (0.76, 1.27) |
| - | - | Ruminant (BacR) | 66.7% (331/496) | 0.98 (0.85, 1.12) |
| - | - | Human (HumM2) | 8.9% (44/496) | 0.94 (0.5, 1.75) |
| Fuhrmeister 2020 | Stored water | Animal (BacCow) | 68.5% (482/704) | 0.97 (0.87, 1.08) |
| - | - | Human (HumM2) | 2.6% (17/651) | 0.44 (0.16, 1.23) |
| - | - | Non-zoonotic E. coli | 19.7% (146/741) | 0.93 (0.7, 1.25) |
| - | - | Zoonotic E. coli | 27.9% (207/741) | 0.96 (0.77, 1.21) |
| - | Child hands | Animal (BacCow) | 97.5% (356/365) | 0.96 (0.93, 1) |
| - | - | Human (HumM2) | 21.9% (74/338) | 0.72 (0.48, 1.07) |
| - | - | Non-zoonotic E. coli | 18% (67/373) | 0.88 (0.57, 1.35) |
| - | - | Zoonotic E. coli | 24.9% (93/373) | 1.03 (0.71, 1.48) |
| - | Mother's hands | Animal (BacCow) | 96.7% (702/726) | 0.98 (0.96, 1.01) |
| - | - | Human (HumM2) | 18.1% (118/651) | 0.96 (0.68, 1.35) |
| - | - | Non-zoonotic E. coli | 12.2% (90/737) | 0.74 (0.51, 1.05) |
| - | - | Zoonotic E. coli | 15.7% (116/737) | 0.9 (0.63, 1.3) |
| - | House soil | Animal (BacCow) | 90.6% (572/631) | 0.99 (0.94, 1.04) |
| - | - | Human (HumM2) | 20.1% (127/631) | 1.24 (0.91, 1.7) |
| - | - | Non-zoonotic E. coli | 28.1% (208/739) | 0.8 (0.64, 0.98) |
| - | - | Zoonotic E. coli | 50.2% (371/739) | 0.99 (0.85, 1.15) |
| Holcomb 2020 | Source water | Avian (GFD) | 0% (0/41) | - |
| - | - | Human (HF183) | 2.4% (1/41) | - |
| - | - | Human (M. smithii) | 0% (0/41) | - |
| - | Stored water | Avian (GFD) | 1.1% (1/94) | - |
| - | - | Human (HF183) | 14.9% (14/94) | 1.72 (0.57, 5.18) |
| - | - | Human (M. smithii) | 0% (0/94) | - |
| - | Latrine soil | Avian (GFD) | 3.3% (2/60) | - |
| - | - | Human (HF183) | 50% (30/60) | 0.88 (0.51, 1.52) |
| - | - | Human (M. smithii) | 45% (27/60) | 0.74 (0.36, 1.55) |
| - | House soil | Avian (GFD) | 3.6% (3/83) | - |
| - | - | Human (HF183) | 42.2% (35/83) | 0.81 (0.49, 1.34) |
| - | - | Human (M. smithii) | 24.1% (20/83) | 1.3 (0.62, 2.73) |
| Capone 2021 | Latrine soil | Non-zoonotic E. coli | 54.5% (48/88) | 0.96 (0.62, 1.5) |
| - | - | Zoonotic E. coli | 18.2% (16/88) | 0.35 (0.12, 1.01) |

## Table S6.

Unadjusted and adjusted results by study, sample type, and aggregated variables for pathogen targets (any pathogen, any bacteria, any viruses, any protozoa, any STH).

| **Study** | **Target** | **Sample** | **Positive, Intervention** | **Negative, Intervention** | **Positive, Control** | **Negative, Control** | **Total observations** | **Unadjusted Prevalence Ratio** | **Unadjusted p-value** | **Adjusted Prevalence Ratio** | **Adjusted p-value** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Capone 2021 in prep | Any pathogen | Any sample | 7 | 13 | 20 | 17 | 57 | PR=0.65 (95% CI: 0.33, 1.28) | 0.21 | PR=0.5 (95% CI: 0.21, 1.19) | 0.12 |
| Capone 2021 | Any pathogen | Any sample | 37 | 6 | 43 | 2 | 88 | PR=0.9 (95% CI: 0.78, 1.03) | 0.13 | PR=0.9 (95% CI: 0.78, 1.03) | 0.13 |
| Fuhrmeister 2020 | Any pathogen | Any sample | 314 | 136 | 348 | 123 | 921 | PR=0.94 (95% CI: 0.87, 1.02) | 0.17 | PR=0.94 (95% CI: 0.87, 1.02) | 0.13 |
| Steinbaum 2019 | Any pathogen | Any sample | 206 | 979 | 173 | 707 | 2,065 | PR=0.88 (95% CI: 0.7, 1.11) | 0.29 | PR=0.88 (95% CI: 0.7, 1.1) | 0.26 |
| Reese 2017 | Any pathogen | Any sample | 185 | 792 | 238 | 825 | 2,040 | PR=0.85 (95% CI: 0.66, 1.08) | 0.18 | PR=0.86 (95% CI: 0.68, 1.09) | 0.21 |
| Boehm 2016 | Any pathogen | Any sample | 19 | 229 | 15 | 234 | 497 | PR=1.27 (95% CI: 0.6, 2.68) | 0.53 | PR=1.28 (95% CI: 0.62, 2.66) | 0.5 |
| Odagiri 2016 | Any pathogen | Any sample | 12 | 18 | 15 | 15 | 60 | PR=0.8 (95% CI: 0.45, 1.42) | 0.45 |  |  |
| Reese 2017 | Any pathogen | Source water | 68 | 588 | 122 | 747 | 1,525 | PR=0.74 (95% CI: 0.49, 1.12) | 0.15 | PR=0.74 (95% CI: 0.5, 1.12) | 0.16 |
| Odagiri 2016 | Any pathogen | Source water | 12 | 18 | 15 | 15 | 60 | PR=0.8 (95% CI: 0.45, 1.42) | 0.45 |  |  |
| Fuhrmeister 2020 | Any pathogen | Stored water | 138 | 218 | 148 | 237 | 741 | PR=1.01 (95% CI: 0.85, 1.2) | 0.93 | PR=1 (95% CI: 0.84, 1.19) | 0.97 |
| Reese 2017 | Any pathogen | Stored water | 134 | 786 | 147 | 860 | 1,927 | PR=1 (95% CI: 0.75, 1.32) | 0.99 | PR=1.01 (95% CI: 0.77, 1.34) | 0.94 |
| Boehm 2016 | Any pathogen | Stored water | 2 | 243 | 1 | 245 | 491 | Not estimated |  | Not estimated |  |
| Kwong 2021 | Any pathogen | House soil | 363 | 125 | 687 | 221 | 1,396 | PR=0.98 (95% CI: 0.91, 1.06) | 0.67 | PR=0.98 (95% CI: 0.91, 1.06) | 0.68 |
| Fuhrmeister 2020 | Any pathogen | House soil | 217 | 144 | 236 | 142 | 739 | PR=0.96 (95% CI: 0.86, 1.08) | 0.53 | PR=0.94 (95% CI: 0.84, 1.06) | 0.31 |
| Steinbaum 2019 | Any pathogen | House soil | 209 | 1,000 | 173 | 725 | 2,107 | PR=0.9 (95% CI: 0.72, 1.13) | 0.35 | PR=0.89 (95% CI: 0.71, 1.11) | 0.31 |
| Boehm 2016 | Any pathogen | House soil | 5 | 242 | 2 | 247 | 496 | PR=2.52 (95% CI: 0.51, 12.42) | 0.26 | PR=2.52 (95% CI: 0.51, 12.42) | 0.26 |
| Capone 2021 | Any pathogen | Latrine soil | 37 | 6 | 43 | 2 | 88 | PR=0.9 (95% CI: 0.78, 1.03) | 0.13 | PR=0.9 (95% CI: 0.78, 1.03) | 0.13 |
| Capone 2021 in prep | Any pathogen |  | 8 | 23 | 25 | 30 | 86 | PR=0.57 (95% CI: 0.28, 1.15) | 0.12 | PR=0.37 (95% CI: 0.16, 0.85) | 0.02 |
| Fuhrmeister 2020 | Any pathogen |  | 75 | 113 | 72 | 116 | 376 | PR=1.04 (95% CI: 0.8, 1.35) | 0.76 | PR=1.05 (95% CI: 0.81, 1.37) | 0.69 |
| Fuhrmeister 2020 | Any pathogen |  | 96 | 266 | 110 | 267 | 739 | PR=0.91 (95% CI: 0.72, 1.15) | 0.43 | PR=0.92 (95% CI: 0.72, 1.16) | 0.47 |
| Boehm 2016 | Any pathogen |  | 16 | 231 | 14 | 232 | 493 | PR=1.14 (95% CI: 0.52, 2.48) | 0.75 | PR=1.13 (95% CI: 0.52, 2.44) | 0.76 |
| Capone 2021 in prep | Any bacteria | Any sample | 7 | 13 | 17 | 20 | 57 | PR=0.76 (95% CI: 0.38, 1.54) | 0.45 | PR=0.6 (95% CI: 0.24, 1.46) | 0.26 |
| Capone 2021 | Any bacteria | Any sample | 28 | 15 | 35 | 10 | 88 | PR=0.84 (95% CI: 0.64, 1.1) | 0.2 | PR=0.85 (95% CI: 0.65, 1.11) | 0.24 |
| Fuhrmeister 2020 | Any bacteria | Any sample | 306 | 144 | 340 | 131 | 921 | PR=0.94 (95% CI: 0.86, 1.03) | 0.18 | PR=0.94 (95% CI: 0.86, 1.02) | 0.14 |
| Reese 2017 | Any bacteria | Any sample | 185 | 792 | 238 | 825 | 2,040 | PR=0.85 (95% CI: 0.66, 1.08) | 0.18 | PR=0.86 (95% CI: 0.68, 1.09) | 0.21 |
| Odagiri 2016 | Any bacteria | Any sample | 8 | 22 | 11 | 19 | 60 | PR=0.73 (95% CI: 0.34, 1.57) | 0.42 |  |  |
| Reese 2017 | Any bacteria | Source water | 68 | 588 | 122 | 747 | 1,525 | PR=0.74 (95% CI: 0.49, 1.12) | 0.15 | PR=0.74 (95% CI: 0.5, 1.12) | 0.16 |
| Odagiri 2016 | Any bacteria | Source water | 8 | 22 | 11 | 19 | 60 | PR=0.73 (95% CI: 0.34, 1.57) | 0.42 |  |  |
| Fuhrmeister 2020 | Any bacteria | Stored water | 138 | 218 | 148 | 237 | 741 | PR=1.01 (95% CI: 0.85, 1.2) | 0.93 | PR=1 (95% CI: 0.84, 1.19) | 0.97 |
| Reese 2017 | Any bacteria | Stored water | 134 | 786 | 147 | 860 | 1,927 | PR=1 (95% CI: 0.75, 1.32) | 0.99 | PR=1.01 (95% CI: 0.77, 1.34) | 0.94 |
| Fuhrmeister 2020 | Any bacteria | House soil | 217 | 144 | 236 | 142 | 739 | PR=0.96 (95% CI: 0.86, 1.08) | 0.53 | PR=0.94 (95% CI: 0.84, 1.06) | 0.31 |
| Capone 2021 | Any bacteria | Latrine soil | 28 | 15 | 35 | 10 | 88 | PR=0.84 (95% CI: 0.64, 1.1) | 0.2 | PR=0.85 (95% CI: 0.65, 1.11) | 0.24 |
| Capone 2021 in prep | Any bacteria |  | 8 | 23 | 21 | 34 | 86 | PR=0.68 (95% CI: 0.32, 1.41) | 0.3 | PR=0.62 (95% CI: 0.28, 1.38) | 0.24 |
| Fuhrmeister 2020 | Any bacteria |  | 64 | 122 | 63 | 124 | 373 | PR=1.02 (95% CI: 0.78, 1.35) | 0.88 | PR=1.02 (95% CI: 0.78, 1.35) | 0.88 |
| Fuhrmeister 2020 | Any bacteria |  | 81 | 281 | 96 | 279 | 737 | PR=0.87 (95% CI: 0.68, 1.13) | 0.3 | PR=0.85 (95% CI: 0.67, 1.09) | 0.2 |
| Capone 2021 in prep | Any virus | Any sample | 0 | 20 | 4 | 33 | 57 | Not estimated |  | Not estimated |  |
| Capone 2021 | Any virus | Any sample | 16 | 27 | 22 | 23 | 88 | PR=0.76 (95% CI: 0.46, 1.25) | 0.28 | PR=0.63 (95% CI: 0.35, 1.14) | 0.13 |
| Fuhrmeister 2020 | Any virus | Any sample | 17 | 330 | 14 | 338 | 699 | PR=1.23 (95% CI: 0.63, 2.4) | 0.54 | PR=1.22 (95% CI: 0.63, 2.34) | 0.56 |
| Boehm 2016 | Any virus | Any sample | 19 | 229 | 15 | 234 | 497 | PR=1.27 (95% CI: 0.6, 2.68) | 0.53 | PR=1.28 (95% CI: 0.62, 2.66) | 0.5 |
| Odagiri 2016 | Any virus | Any sample | 7 | 23 | 10 | 20 | 60 | PR=0.7 (95% CI: 0.3, 1.62) | 0.4 |  |  |
| Odagiri 2016 | Any virus | Source water | 7 | 23 | 10 | 20 | 60 | PR=0.7 (95% CI: 0.3, 1.62) | 0.4 |  |  |
| Boehm 2016 | Any virus | Stored water | 2 | 243 | 1 | 245 | 491 | Not estimated |  | Not estimated |  |
| Boehm 2016 | Any virus | House soil | 5 | 242 | 2 | 247 | 496 | PR=2.52 (95% CI: 0.51, 12.42) | 0.26 | PR=2.52 (95% CI: 0.51, 12.42) | 0.26 |
| Capone 2021 | Any virus | Latrine soil | 16 | 27 | 22 | 23 | 88 | PR=0.76 (95% CI: 0.46, 1.25) | 0.28 | PR=0.63 (95% CI: 0.35, 1.14) | 0.13 |
| Capone 2021 in prep | Any virus |  | 0 | 31 | 5 | 50 | 86 | PR=0 (95% CI: 0, 0) | 0 | PR=0 (95% CI: 0, 0) | 0 |
| Fuhrmeister 2020 | Any virus |  | 7 | 162 | 7 | 161 | 337 | PR=0.99 (95% CI: 0.37, 2.69) | 0.99 | PR=0.99 (95% CI: 0.37, 2.69) | 0.99 |
| Fuhrmeister 2020 | Any virus |  | 11 | 331 | 10 | 332 | 684 | PR=1.1 (95% CI: 0.47, 2.57) | 0.83 | PR=1.06 (95% CI: 0.45, 2.46) | 0.9 |
| Boehm 2016 | Any virus |  | 16 | 231 | 14 | 232 | 493 | PR=1.14 (95% CI: 0.52, 2.48) | 0.75 | PR=1.13 (95% CI: 0.52, 2.44) | 0.76 |
| Capone 2021 in prep | Any protozoa | Any sample | 0 | 20 | 3 | 34 | 57 | Not estimated |  | Not estimated |  |
| Capone 2021 | Any protozoa | Any sample | 15 | 28 | 19 | 26 | 88 | PR=0.83 (95% CI: 0.48, 1.42) | 0.49 | PR=0.83 (95% CI: 0.48, 1.42) | 0.49 |
| Fuhrmeister 2020 | Any protozoa | Any sample | 12 | 293 | 16 | 291 | 612 | PR=0.75 (95% CI: 0.35, 1.65) | 0.48 | PR=0.77 (95% CI: 0.35, 1.67) | 0.5 |
| Capone 2021 | Any protozoa | Latrine soil | 15 | 28 | 19 | 26 | 88 | PR=0.83 (95% CI: 0.48, 1.42) | 0.49 | PR=0.83 (95% CI: 0.48, 1.42) | 0.49 |
| Capone 2021 in prep | Any protozoa |  | 0 | 31 | 4 | 51 | 86 | Not estimated |  | Not estimated |  |
| Fuhrmeister 2020 | Any protozoa |  | 7 | 147 | 8 | 149 | 311 | PR=0.89 (95% CI: 0.33, 2.38) | 0.82 | PR=0.89 (95% CI: 0.33, 2.38) | 0.82 |
| Fuhrmeister 2020 | Any protozoa |  | 5 | 296 | 9 | 292 | 602 | PR=0.56 (95% CI: 0.14, 2.13) | 0.39 | PR=0.56 (95% CI: 0.14, 2.13) | 0.39 |
| Capone 2021 in prep | Any STH | Any sample | 0 | 20 | 3 | 34 | 57 | Not estimated |  | Not estimated |  |
| Capone 2021 | Any STH | Any sample | 20 | 23 | 34 | 11 | 88 | PR=0.62 (95% CI: 0.43, 0.89) | 0.01 | PR=0.69 (95% CI: 0.45, 1.07) | 0.1 |
| Steinbaum 2019 | Any STH | Any sample | 206 | 979 | 173 | 707 | 2,065 | PR=0.88 (95% CI: 0.7, 1.11) | 0.29 | PR=0.88 (95% CI: 0.7, 1.1) | 0.26 |
| Kwong 2021 | Any STH | House soil | 363 | 125 | 687 | 221 | 1,396 | PR=0.98 (95% CI: 0.91, 1.06) | 0.67 | PR=0.98 (95% CI: 0.91, 1.06) | 0.68 |
| Steinbaum 2019 | Any STH | House soil | 209 | 1,000 | 173 | 725 | 2,107 | PR=0.9 (95% CI: 0.72, 1.13) | 0.35 | PR=0.89 (95% CI: 0.71, 1.11) | 0.31 |
| Capone 2021 | Any STH | Latrine soil | 20 | 23 | 34 | 11 | 88 | PR=0.62 (95% CI: 0.43, 0.89) | 0.01 | PR=0.69 (95% CI: 0.45, 1.07) | 0.1 |
| Capone 2021 in prep | Any STH |  | 0 | 31 | 3 | 52 | 86 | Not estimated |  | Not estimated |  |

## Table S7.

Unadjusted and adjusted results by study, sample type, and aggregated variables for MST targets (any MST, any general MST, any human MST, any animal MST).

| **Study** | **Target** | **Sample** | **Positive, Intervention** | **Negative, Intervention** | **Positive, Control** | **Negative, Control** | **Total observations** | **Unadjusted Prevalence Ratio** | **Unadjusted p-value** | **Adjusted Prevalence Ratio** | **Adjusted p-value** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Capone 2021 in prep | Any MST Marker | Any sample | 20 | 0 | 32 | 5 | 57 | PR=1.16 (95% CI: 1.02, 1.32) | 0.03 | PR=1.16 (95% CI: 1.02, 1.32) | 0.03 |
| Holcomb 2020 | Any MST Marker | Any sample | 41 | 28 | 45 | 16 | 130 | PR=0.81 (95% CI: 0.61, 1.07) | 0.13 | PR=0.85 (95% CI: 0.65, 1.11) | 0.24 |
| Fuhrmeister 2020 | Any MST Marker | Any sample | 421 | 26 | 438 | 29 | 914 | PR=1 (95% CI: 0.97, 1.04) | 0.8 | PR=1.01 (95% CI: 0.97, 1.04) | 0.7 |
| Boehm 2016 | Any MST Marker | Any sample | 220 | 28 | 222 | 27 | 497 | PR=0.99 (95% CI: 0.93, 1.06) | 0.88 | PR=0.99 (95% CI: 0.93, 1.06) | 0.76 |
| Odagiri 2016 | Any MST Marker | Any sample | 30 | 0 | 28 | 2 | 60 | Not estimated |  |  |  |
| Holcomb 2020 | Any MST Marker | Source water | 1 | 21 | 0 | 19 | 41 | Not estimated |  | Not estimated |  |
| Odagiri 2016 | Any MST Marker | Source water | 30 | 0 | 28 | 2 | 60 | Not estimated |  |  |  |
| Holcomb 2020 | Any MST Marker | Stored water | 9 | 39 | 6 | 40 | 94 | PR=1.44 (95% CI: 0.51, 4.08) | 0.5 | PR=1.44 (95% CI: 0.51, 4.08) | 0.5 |
| Fuhrmeister 2020 | Any MST Marker | Stored water | 230 | 119 | 256 | 119 | 724 | PR=0.97 (95% CI: 0.87, 1.07) | 0.52 | PR=0.97 (95% CI: 0.88, 1.08) | 0.63 |
| Boehm 2016 | Any MST Marker | Stored water | 57 | 188 | 82 | 164 | 491 | PR=0.7 (95% CI: 0.51, 0.96) | 0.03 | PR=0.69 (95% CI: 0.5, 0.95) | 0.02 |
| Holcomb 2020 | Any MST Marker | House soil | 21 | 18 | 26 | 18 | 83 | PR=0.91 (95% CI: 0.6, 1.38) | 0.66 | PR=0.95 (95% CI: 0.62, 1.46) | 0.82 |
| Fuhrmeister 2020 | Any MST Marker | House soil | 283 | 38 | 297 | 36 | 654 | PR=0.99 (95% CI: 0.93, 1.05) | 0.7 | PR=0.99 (95% CI: 0.93, 1.05) | 0.66 |
| Boehm 2016 | Any MST Marker | House soil | 180 | 67 | 187 | 62 | 496 | PR=0.97 (95% CI: 0.87, 1.08) | 0.59 | PR=0.97 (95% CI: 0.87, 1.08) | 0.58 |
| Holcomb 2020 | Any MST Marker | Latrine soil | 21 | 9 | 22 | 8 | 60 | PR=0.95 (95% CI: 0.69, 1.32) | 0.78 | PR=0.95 (95% CI: 0.69, 1.32) | 0.78 |
| Capone 2021 in prep | Any MST Marker |  | 27 | 4 | 42 | 13 | 86 | PR=1.14 (95% CI: 0.93, 1.39) | 0.2 | PR=1.14 (95% CI: 0.93, 1.39) | 0.2 |
| Fuhrmeister 2020 | Any MST Marker |  | 174 | 11 | 182 | 1 | 368 | PR=0.95 (95% CI: 0.91, 0.98) | 0.01 | PR=0.95 (95% CI: 0.91, 0.98) | 0.01 |
| Fuhrmeister 2020 | Any MST Marker |  | 346 | 14 | 359 | 9 | 728 | PR=0.99 (95% CI: 0.96, 1.01) | 0.26 | PR=0.99 (95% CI: 0.96, 1.01) | 0.29 |
| Boehm 2016 | Any MST Marker |  | 145 | 102 | 148 | 98 | 493 | PR=0.98 (95% CI: 0.82, 1.16) | 0.78 | PR=0.97 (95% CI: 0.82, 1.15) | 0.74 |
| Capone 2021 in prep | Any human MST Marker | Any sample | 17 | 3 | 30 | 7 | 57 | PR=1.05 (95% CI: 0.82, 1.34) | 0.71 | PR=1.05 (95% CI: 0.82, 1.34) | 0.71 |
| Holcomb 2020 | Any human MST Marker | Any sample | 41 | 28 | 44 | 17 | 130 | PR=0.82 (95% CI: 0.62, 1.09) | 0.18 | PR=0.87 (95% CI: 0.67, 1.14) | 0.32 |
| Fuhrmeister 2020 | Any human MST Marker | Any sample | 124 | 313 | 133 | 330 | 900 | PR=0.99 (95% CI: 0.8, 1.22) | 0.91 | PR=1.01 (95% CI: 0.82, 1.25) | 0.92 |
| Boehm 2016 | Any human MST Marker | Any sample | 26 | 222 | 26 | 223 | 497 | PR=1 (95% CI: 0.57, 1.75) | 0.99 | PR=1 (95% CI: 0.57, 1.76) | 0.99 |
| Odagiri 2016 | Any human MST Marker | Any sample | 22 | 8 | 21 | 9 | 60 | PR=1.05 (95% CI: 0.76, 1.45) | 0.78 |  |  |
| Holcomb 2020 | Any human MST Marker | Source water | 1 | 21 | 0 | 19 | 41 | Not estimated |  | Not estimated |  |
| Odagiri 2016 | Any human MST Marker | Source water | 22 | 8 | 21 | 9 | 60 | PR=1.05 (95% CI: 0.76, 1.45) | 0.78 |  |  |
| Holcomb 2020 | Any human MST Marker | Stored water | 9 | 39 | 5 | 41 | 94 | PR=1.72 (95% CI: 0.57, 5.18) | 0.33 | PR=1.72 (95% CI: 0.57, 5.18) | 0.33 |
| Fuhrmeister 2020 | Any human MST Marker | Stored water | 5 | 310 | 12 | 324 | 651 | PR=0.44 (95% CI: 0.16, 1.23) | 0.12 | PR=0.44 (95% CI: 0.16, 1.23) | 0.12 |
| Boehm 2016 | Any human MST Marker | Stored water | 0 | 245 | 0 | 246 | 491 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | Any human MST Marker | House soil | 20 | 19 | 26 | 18 | 83 | PR=0.87 (95% CI: 0.57, 1.32) | 0.5 | PR=0.9 (95% CI: 0.59, 1.38) | 0.63 |
| Fuhrmeister 2020 | Any human MST Marker | House soil | 68 | 243 | 59 | 261 | 631 | PR=1.19 (95% CI: 0.87, 1.61) | 0.28 | PR=1.24 (95% CI: 0.91, 1.7) | 0.18 |
| Boehm 2016 | Any human MST Marker | House soil | 21 | 226 | 23 | 226 | 496 | PR=0.92 (95% CI: 0.5, 1.71) | 0.79 | PR=0.94 (95% CI: 0.5, 1.75) | 0.84 |
| Holcomb 2020 | Any human MST Marker | Latrine soil | 21 | 9 | 22 | 8 | 60 | PR=0.95 (95% CI: 0.69, 1.32) | 0.78 | PR=0.95 (95% CI: 0.69, 1.32) | 0.78 |
| Capone 2021 in prep | Any human MST Marker |  | 24 | 7 | 38 | 17 | 86 | PR=1.12 (95% CI: 0.83, 1.51) | 0.46 | PR=1.02 (95% CI: 0.75, 1.41) | 0.88 |
| Fuhrmeister 2020 | Any human MST Marker |  | 30 | 142 | 44 | 122 | 338 | PR=0.66 (95% CI: 0.44, 0.99) | 0.04 | PR=0.72 (95% CI: 0.48, 1.07) | 0.11 |
| Fuhrmeister 2020 | Any human MST Marker |  | 58 | 268 | 60 | 265 | 651 | PR=0.96 (95% CI: 0.68, 1.37) | 0.84 | PR=0.96 (95% CI: 0.68, 1.35) | 0.82 |
| Boehm 2016 | Any human MST Marker |  | 7 | 240 | 5 | 241 | 493 | PR=1.39 (95% CI: 0.46, 4.2) | 0.56 | PR=1.39 (95% CI: 0.46, 4.2) | 0.56 |
| Capone 2021 in prep | Any animal MST Marker | Any sample | 12 | 8 | 17 | 20 | 57 | PR=1.31 (95% CI: 0.78, 2.17) | 0.3 | PR=1.2 (95% CI: 0.72, 1.99) | 0.48 |
| Holcomb 2020 | Any animal MST Marker | Any sample | 3 | 66 | 2 | 59 | 130 | PR=1.33 (95% CI: 0.18, 9.59) | 0.78 | PR=1.33 (95% CI: 0.18, 9.59) | 0.78 |
| Fuhrmeister 2020 | Any animal MST Marker | Any sample | 419 | 26 | 437 | 28 | 910 | PR=1 (95% CI: 0.97, 1.04) | 0.91 | PR=1 (95% CI: 0.97, 1.04) | 0.8 |
| Boehm 2016 | Any animal MST Marker | Any sample | 219 | 29 | 221 | 28 | 497 | PR=0.99 (95% CI: 0.93, 1.06) | 0.88 | PR=0.99 (95% CI: 0.93, 1.06) | 0.74 |
| Odagiri 2016 | Any animal MST Marker | Any sample | 28 | 2 | 27 | 3 | 60 | PR=1.04 (95% CI: 0.89, 1.21) | 0.65 |  |  |
| Holcomb 2020 | Any animal MST Marker | Source water | 0 | 22 | 0 | 19 | 41 | Not estimated |  | Not estimated |  |
| Odagiri 2016 | Any animal MST Marker | Source water | 28 | 2 | 27 | 3 | 60 | PR=1.04 (95% CI: 0.89, 1.21) | 0.65 |  |  |
| Holcomb 2020 | Any animal MST Marker | Stored water | 0 | 48 | 1 | 45 | 94 | Not estimated |  | Not estimated |  |
| Fuhrmeister 2020 | Any animal MST Marker | Stored water | 229 | 113 | 253 | 109 | 704 | PR=0.96 (95% CI: 0.86, 1.07) | 0.43 | PR=0.97 (95% CI: 0.87, 1.08) | 0.57 |
| Boehm 2016 | Any animal MST Marker | Stored water | 57 | 188 | 82 | 164 | 491 | PR=0.7 (95% CI: 0.51, 0.96) | 0.03 | PR=0.69 (95% CI: 0.5, 0.95) | 0.02 |
| Holcomb 2020 | Any animal MST Marker | House soil | 2 | 37 | 1 | 43 | 83 | Not estimated |  | Not estimated |  |
| Fuhrmeister 2020 | Any animal MST Marker | House soil | 281 | 30 | 291 | 29 | 631 | PR=0.99 (95% CI: 0.94, 1.05) | 0.82 | PR=0.99 (95% CI: 0.94, 1.04) | 0.72 |
| Boehm 2016 | Any animal MST Marker | House soil | 178 | 69 | 186 | 63 | 496 | PR=0.96 (95% CI: 0.86, 1.08) | 0.53 | PR=0.96 (95% CI: 0.86, 1.08) | 0.51 |
| Holcomb 2020 | Any animal MST Marker | Latrine soil | 2 | 28 | 0 | 30 | 60 | Not estimated |  | Not estimated |  |
| Capone 2021 in prep | Any animal MST Marker |  | 12 | 19 | 18 | 37 | 86 | PR=1.18 (95% CI: 0.7, 2) | 0.53 | PR=1.33 (95% CI: 0.62, 2.86) | 0.47 |
| Fuhrmeister 2020 | Any animal MST Marker |  | 174 | 8 | 182 | 1 | 365 | PR=0.96 (95% CI: 0.93, 1) | 0.03 | PR=0.96 (95% CI: 0.93, 1) | 0.03 |
| Fuhrmeister 2020 | Any animal MST Marker |  | 344 | 15 | 358 | 9 | 726 | PR=0.98 (95% CI: 0.96, 1.01) | 0.17 | PR=0.98 (95% CI: 0.96, 1.01) | 0.19 |
| Boehm 2016 | Any animal MST Marker |  | 144 | 103 | 147 | 99 | 493 | PR=0.98 (95% CI: 0.82, 1.16) | 0.78 | PR=0.97 (95% CI: 0.82, 1.15) | 0.7 |

## Table S8.

Baseline covariates by study. Note that Odigari et al. 2016 is not included as data shared from this study were from village water sources and did not have associated covariates from individual households; therefore all estimates for this study are unadjusted.

| **.** | **Boehm 2016** | **Reese 2017** | **Steinbaum 2019** | **Fuhrmeister 2020** | **Holcomb 2020** | **Capone 2021** | **Capone 2022 in prep.** | **Kwong 2021** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5-8 | 7934 (40.1%) | 17171 (74.6%) | 13676 (54.5%) | 18611 (39.2%) | 759 (29.8%) | 364 (8.0%) | 78 (5.3%) | 6360 (37.8%) |
| >8 | 1060 (5.4%) | 4404 (19.1%) | 2952 (11.8%) | 3073 (6.5%) | 1275 (50.0%) | 4212 (92.0%) | 1404 (94.7%) | 1020 (6.1%) |
| Missing | 0 (0%) | 0 (0%) | 1216 (4.8%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
| Number of rooms in the household |  |  |  |  |  |  |  |  |
| 1-2 | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1431 (56.1%) | 3172 (69.3%) | 1066 (71.9%) | 0 (0%) |
| >3 | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1119 (43.9%) | 1404 (30.7%) | 416 (28.1%) | 0 (0%) |
| Missing | 19778 (100%) | 23026 (100%) | 25116 (100%) | 47483 (100%) | 0 (0%) | 0 (0%) | 0 (0%) | 16806 (100%) |
| Improved roof |  |  |  |  |  |  |  |  |
| 0 | 320 (1.6%) | 0 (0%) | 8208 (32.7%) | 517 (1.1%) | 0 (0%) | 0 (0%) | 0 (0%) | 276 (1.6%) |
| 1 | 19458 (98.4%) | 0 (0%) | 16908 (67.3%) | 46966 (98.9%) | 0 (0%) | 0 (0%) | 0 (0%) | 16530 (98.4%) |
| Missing | 0 (0%) | 23026 (100%) | 0 (0%) | 0 (0%) | 2550 (100%) | 4576 (100%) | 1482 (100%) | 0 (0%) |
| Father in agriculture |  |  |  |  |  |  |  |  |
| 0 | 13210 (66.8%) | 10778 (46.8%) | 0 (0%) | 32850 (69.2%) | 0 (0%) | 0 (0%) | 0 (0%) | 11466 (68.2%) |
| 1 | 6568 (33.2%) | 9489 (41.2%) | 0 (0%) | 14633 (30.8%) | 0 (0%) | 0 (0%) | 0 (0%) | 5340 (31.8%) |
| Missing | 0 (0%) | 2759 (12.0%) | 25116 (100%) | 0 (0%) | 2550 (100%) | 4576 (100%) | 1482 (100%) | 0 (0%) |
| Land owned |  |  |  |  |  |  |  |  |
| 0 | 0 (0%) | 8718 (37.9%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
| 1 | 0 (0%) | 11486 (49.9%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
| Missing | 19778 (100%) | 2822 (12.3%) | 25116 (100%) | 47483 (100%) | 2550 (100%) | 4576 (100%) | 1482 (100%) | 16806 (100%) |
| Acres of land owned |  |  |  |  |  |  |  |  |
| Mean (SD) | 0.111 (0.129) | NA (NA) | NA (NA) | 0.154 (0.199) | NA (NA) | NA (NA) | NA (NA) | 0.142 (0.211) |
| Median [Min, Max] | 0.0700 [0.0100, 1.23] | NA [NA, NA] | NA [NA, NA] | 0.0800 [0.0100, 2.10] | NA [NA, NA] | NA [NA, NA] | NA [NA, NA] | 0.0800 [0.0100, 3.15] |
| Missing | 520 (2.6%) | 23026 (100%) | 25116 (100%) | 1809 (3.8%) | 2550 (100%) | 4576 (100%) | 1482 (100%) | 744 (4.4%) |
| Maternal education |  |  |  |  |  |  |  |  |
| No education | 3394 (17.2%) | 0 (0%) | 0 (0%) | 6705 (14.1%) | 96 (3.8%) | 0 (0%) | 0 (0%) | 2484 (14.8%) |
| Incomplete Primary | 0 (0%) | 9113 (39.6%) | 12944 (51.5%) | 0 (0%) | 642 (25.2%) | 0 (0%) | 0 (0%) | 0 (0%) |
| Primary | 7160 (36.2%) | 2401 (10.4%) | 6044 (24.1%) | 14328 (30.2%) | 279 (10.9%) | 0 (0%) | 0 (0%) | 5424 (32.3%) |
| Secondary | 9224 (46.6%) | 6205 (26.9%) | 5956 (23.7%) | 26450 (55.7%) | 528 (20.7%) | 0 (0%) | 0 (0%) | 8898 (52.9%) |
| More than secondary | 0 (0%) | 685 (3.0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
| Missing | 0 (0%) | 4622 (20.1%) | 172 (0.7%) | 0 (0%) | 1005 (39.4%) | 4576 (100%) | 1482 (100%) | 0 (0%) |
| Maternal age |  |  |  |  |  |  |  |  |
| Mean (SD) | 23.7 (5.18) | NA (NA) | 26.4 (6.32) | 23.7 (5.07) | NA (NA) | NA (NA) | NA (NA) | 23.9 (5.03) |
| Median [Min, Max] | 23.0 [15.0, 42.0] | NA [NA, NA] | 25.5 [14.9, 47.9] | 23.0 [15.0, 41.0] | NA [NA, NA] | NA [NA, NA] | NA [NA, NA] | 24.0 [15.0, 43.0] |
| Missing | 0 (0%) | 23026 (100%) | 280 (1.1%) | 0 (0%) | 2550 (100%) | 4576 (100%) | 1482 (100%) | 24 (0.1%) |
| Improved wall |  |  |  |  |  |  |  |  |
| 0 | 3120 (15.8%) | 0 (0%) | 24060 (95.8%) | 16088 (33.9%) | 585 (22.9%) | 832 (18.2%) | 260 (17.5%) | 4428 (26.3%) |
| 1 | 16658 (84.2%) | 0 (0%) | 1056 (4.2%) | 31395 (66.1%) | 1965 (77.1%) | 3744 (81.8%) | 1222 (82.5%) | 12378 (73.7%) |
| Missing | 0 (0%) | 23026 (100%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
| Improved floor |  |  |  |  |  |  |  |  |
| 0 | 18338 (92.7%) | 0 (0%) | 23816 (94.8%) | 42313 (89.1%) | 54 (2.1%) | 52 (1.1%) | 26 (1.8%) | 15084 (89.8%) |
| 1 | 1440 (7.3%) | 0 (0%) | 1300 (5.2%) | 5170 (10.9%) | 2496 (97.9%) | 4524 (98.9%) | 1456 (98.2%) | 1722 (10.2%) |
| Missing | 0 (0%) | 23026 (100%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
| Electricity |  |  |  |  |  |  |  |  |
| 0 | 9298 (47.0%) | 3780 (16.4%) | 23344 (92.9%) | 19116 (40.3%) | 81 (3.2%) | 208 (4.5%) | 52 (3.5%) | 7020 (41.8%) |
| 1 | 10480 (53.0%) | 18812 (81.7%) | 1748 (7.0%) | 28367 (59.7%) | 2469 (96.8%) | 4368 (95.5%) | 1430 (96.5%) | 9786 (58.2%) |
| Missing | 0 (0%) | 434 (1.9%) | 24 (0.1%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |