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

Andrew Mertens, Jack Colford, Oliver Cumming, Joe Brown, Jill Stewart, David Holcomb, Jackie Knee, Tom Clasen, Heather Reese, Amy Pickering, Clair Null, Steve Luby, Jessica Grembi, Ben Arnold, Audrie Lin, Jade Benjamin-Chung, Laura Kwong, Lauren Steinbaum, Ali Boehm, Kara Nelson, Erica Fuhrmeister, Mahbubur Rahman, Sammy Njenga, Rassul Nala, Ayse Ercumen (middle order not finalized)

# Supplementary Tables

## Table S1. Systematic review Search terms

Different columns denote separation by “AND” in the search string.

| **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 | Stored water | V. cholerae | 31.7% (19/60) | 0.73 (0.34, 1.57) |
| - | - | Adenovirus | 8.3% (5/60) | - |
| - | - | 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) | 1.05 (0.48, 2.27) |
| - | House soil | Rotavirus | 1.4% (7/496) | - |
| 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) | 0.89 (0.69, 1.15) |
| - | - | Trichuris | 6.9% (146/2107) | 0.85 (0.6, 1.22) |
| 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) | 1.16 (0.48, 2.81) |
| - | House soil | Pathogenic E. coli | 61.3% (453/739) | 0.94 (0.83, 1.06) |
| Holcomb 2020 | House soil | C. difficile | 14.8% (13/88) | 0.9 (0.32, 2.48) |
| - | - | Campylobacter | 6.8% (6/88) | - |
| - | - | Pathogenic E. coli | 56.8% (50/88) | 0.72 (0.49, 1.07) |
| - | - | Salmonella | 6.8% (6/88) | - |
| - | - | 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) | 0.64 (0.43, 0.94) |
| - | - | Trichuris | 17% (15/88) | 0.92 (0.36, 2.33) |
| - | - | Cryptosporidium | 8% (7/88) | - |
| - | - | Entamoeba histolytica | 1.1% (1/88) | - |
| - | - | Giardia | 31.8% (28/88) | 0.6 (0.31, 1.15) |
| - | - | Adenovirus | 20.5% (18/88) | 0.21 (0.06, 0.68) |
| - | - | Astrovirus | 29.5% (26/88) | 1.04 (0.52, 2.07) |
| - | - | Norovirus | 2.3% (2/88) | - |
| - | - | Rotavirus | 4.5% (4/88) | - |
| - | - | Sapovirus | 0% (0/88) | - |
| - | Flies in kitchen | Campylobacter | 2.1% (1/48) | - |
| - | - | Pathogenic E. coli | 25% (12/48) | 0.78 (0.25, 2.47) |
| - | - | Shigella | 2.1% (1/48) | - |
| - | - | V. cholerae | 4.2% (2/48) | - |
| - | - | Ascaris | 0% (0/48) | - |
| - | - | Trichuris | 4.2% (2/48) | - |
| - | - | Giardia | 2.1% (1/48) | - |
| - | - | Adenovirus | 0% (0/48) | - |
| - | - | Astrovirus | 0% (0/48) | - |
| - | - | Norovirus | 0% (0/48) | - |
| - | - | Pan enterovirus | 0% (0/48) | - |
| - | - | Rotavirus | 0% (0/48) | - |
| - | - | Sapovirus | 0% (0/48) | - |
| - | Flies in latrine | Campylobacter | 0% (0/38) | - |
| - | - | Pathogenic E. coli | 36.8% (14/38) | - |
| - | - | Shigella | 2.6% (1/38) | - |
| - | - | V. cholerae | 0% (0/38) | - |
| - | - | Ascaris | 0% (0/38) | - |
| - | - | Trichuris | 2.6% (1/38) | - |
| - | - | Giardia | 7.9% (3/38) | - |
| - | - | Adenovirus | 10.5% (4/38) | - |
| - | - | Astrovirus | 0% (0/38) | - |
| - | - | Norovirus | 5.3% (2/38) | - |
| - | - | Pan enterovirus | 0% (0/38) | - |
| - | - | Rotavirus | 2.6% (1/38) | - |
| - | - | Sapovirus | 0% (0/38) | - |
| Kwong 2021 | House soil | Ascaris | 62.3% (886/1423) | 0.97 (0.87, 1.08) |
| - | - | 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)** |
| --- | --- | --- | --- |
| Odagiri 2016 | Stored water | Cow (BacCow) | 91.7% (55/60) |
| - | - | General (BacUni) | 76.7% (46/60) |
| - | - | Human (Bacteroides) | 71.7% (43/60) |
| Boehm 2016 | Stored water | Avian (GFD) | 9.3% (46/493) |
| - | - | Ruminant (BacR) | 21.9% (108/493) |
| - | - | General (GenBac3) | 93.5% (461/493) |
| - | - | Human (HumM2) | 0% (0/493) |
| - | Child hands | Avian (GFD) | 16.2% (80/493) |
| - | - | Ruminant (BacR) | 54.2% (267/493) |
| - | - | General (GenBac3) | 98.6% (486/493) |
| - | - | Human (HumM2) | 2.4% (12/493) |
| - | House soil | Avian (GFD) | 33.3% (165/496) |
| - | - | Ruminant (BacR) | 66.7% (331/496) |
| - | - | General (GenBac3) | 100% (496/496) |
| - | - | Human (HumM2) | 8.9% (44/496) |
| Fuhrmeister 2020 | Stored water | Cow (BacCow) | 68.5% (482/704) |
| - | - | Human (HumM2) | 2.6% (17/651) |
| - | - | Non-zoonotic E. coli | 19.7% (146/741) |
| - | - | Zoonotic E. coli | 27.9% (207/741) |
| - | Child hands | Cow (BacCow) | 97.5% (356/365) |
| - | - | Human (HumM2) | 21.9% (74/338) |
| - | - | Non-zoonotic E. coli | 18% (67/373) |
| - | - | Zoonotic E. coli | 24.9% (93/373) |
| - | Mother's hands | Cow (BacCow) | 96.7% (702/726) |
| - | - | Human (HumM2) | 18.1% (118/651) |
| - | - | Non-zoonotic E. coli | 12.2% (90/737) |
| - | - | Zoonotic E. coli | 15.7% (116/737) |
| - | House soil | Cow (BacCow) | 90.6% (572/631) |
| - | - | Human (HumM2) | 20.1% (127/631) |
| - | - | Non-zoonotic E. coli | 28.1% (208/739) |
| - | - | Zoonotic E. coli | 50.2% (371/739) |
| Holcomb 2020 | Source water | Avian (GFD) | 0% (0/41) |
| - | - | Human (Bacteroides) | 2.4% (1/41) |
| - | - | Human (M. smithii) | 0% (0/41) |
| - | Stored water | Avian (GFD) | 1.1% (1/94) |
| - | - | Human (Bacteroides) | 14.9% (14/94) |
| - | - | Human (M. smithii) | 0% (0/94) |
| - | Latrine soil | Avian (GFD) | 3.3% (2/60) |
| - | - | Human (Bacteroides) | 50% (30/60) |
| - | - | Human (M. smithii) | 45% (27/60) |
| - | House soil | Avian (GFD) | 3.6% (3/83) |
| - | - | Human (Bacteroides) | 42.2% (35/83) |
| - | - | Human (M. smithii) | 24.1% (20/83) |
| - | - | Non-zoonotic E. coli | 54.5% (48/88) |
| - | - | Zoonotic E. coli | 18.2% (16/88) |
| - | Flies in kitchen | Cow (BacCow) | 14.6% (7/48) |
| - | - | Dog (BacCan) | 35.4% (17/48) |
| - | - | Human (Bacteroides) | 68.8% (33/48) |
| - | Flies in latrine | Cow (BacCow) | 10.5% (4/38) |
| - | - | Dog (BacCan) | 23.7% (9/38) |
| - | - | Human (Bacteroides) | 76.3% (29/38) |

## Table S6.

Unadjusted and adjusted results by study, sample, and target.

| **Study** | **Sample** | **Target** | **Positive, Intervention** | **Negative, Intervention** | **Positive, Control** | **Negative, Control** | **Total observations** | **Unadjusted Prevalence Ratio** | **Unadjusted p-value** | **Adjusted Prevalence Ratio** | **Adjusted p-value** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Kwong 2021 | House soil | Any pathogen | 363 | 125 | 687 | 221 | 1,396 | PR=1 (95% CI: 0.9, 1.1) | 0.67 | PR=1 (95% CI: 0.9, 1.1) | 0.68 |
| Kwong 2021 | House soil | Any STH | 363 | 125 | 687 | 221 | 1,396 | PR=1 (95% CI: 0.9, 1.1) | 0.67 | PR=1 (95% CI: 0.9, 1.1) | 0.68 |
| Holcomb 2020 | Any sample | Any pathogen | 44 | 19 | 63 | 19 | 145 | PR=0.9 (95% CI: 0.8, 1.1) | 0.33 | PR=0.9 (95% CI: 0.8, 1.1) | 0.33 |
| Holcomb 2020 | Any sample | Any MST Marker | 34 | 7 | 39 | 9 | 89 | PR=1 (95% CI: 0.8, 1.2) | 0.84 | PR=1 (95% CI: 0.8, 1.2) | 0.84 |
| Holcomb 2020 | Any sample | Any human MST Marker | 30 | 9 | 33 | 5 | 77 | PR=0.9 (95% CI: 0.7, 1.1) | 0.27 | PR=0.9 (95% CI: 0.7, 1.1) | 0.27 |
| Holcomb 2020 | Any sample | Any animal MST Marker | 13 | 28 | 19 | 29 | 89 | PR=0.8 (95% CI: 0.5, 1.4) | 0.45 | PR=0.8 (95% CI: 0.5, 1.4) | 0.46 |
| Holcomb 2020 | Any sample | Any bacteria | 35 | 28 | 52 | 30 | 145 | PR=0.9 (95% CI: 0.7, 1.1) | 0.31 | PR=0.9 (95% CI: 0.7, 1.1) | 0.31 |
| Holcomb 2020 | Any sample | Any virus | 16 | 47 | 26 | 56 | 145 | PR=0.8 (95% CI: 0.5, 1.3) | 0.38 | PR=0.7 (95% CI: 0.4, 1.2) | 0.2 |
| Holcomb 2020 | Any sample | Any protozoa | 15 | 48 | 22 | 60 | 145 | PR=0.9 (95% CI: 0.5, 1.5) | 0.66 | PR=0.9 (95% CI: 0.5, 1.5) | 0.58 |
| Holcomb 2020 | Any sample | Any STH | 20 | 43 | 37 | 45 | 145 | PR=0.7 (95% CI: 0.5, 1) | 0.08 | PR=0.6 (95% CI: 0.4, 0.9) | 0.02 |
| Holcomb 2020 | Flies in kitchen | Any pathogen | 7 | 20 | 8 | 13 | 48 | PR=0.7 (95% CI: 0.3, 1.7) | 0.4 | PR=0.7 (95% CI: 0.3, 1.7) | 0.4 |
| Holcomb 2020 | Flies in kitchen | Any MST Marker | 23 | 4 | 16 | 5 | 48 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | Flies in kitchen | Any human MST Marker | 20 | 7 | 13 | 8 | 48 | PR=1.2 (95% CI: 0.8, 1.9) | 0.42 | PR=1.2 (95% CI: 0.8, 1.9) | 0.42 |
| Holcomb 2020 | Flies in kitchen | Any animal MST Marker | 10 | 17 | 10 | 11 | 48 | PR=0.8 (95% CI: 0.4, 1.4) | 0.39 | PR=0.8 (95% CI: 0.4, 1.4) | 0.39 |
| Holcomb 2020 | Flies in kitchen | Any bacteria | 7 | 20 | 7 | 14 | 48 | PR=0.8 (95% CI: 0.3, 2.1) | 0.61 | PR=0.8 (95% CI: 0.3, 2.1) | 0.61 |
| Holcomb 2020 | Flies in kitchen | Any virus | 0 | 27 | 0 | 21 | 48 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | Flies in kitchen | Any protozoa | 0 | 27 | 1 | 20 | 48 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | Flies in kitchen | Any STH | 0 | 27 | 2 | 19 | 48 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | Flies in latrine | Any pathogen | 1 | 3 | 17 | 17 | 38 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | Flies in latrine | Any MST Marker | 2 | 2 | 8 | 26 | 38 | PR=2.1 (95% CI: 0.5, 8.4) | 0.28 | PR=2.1 (95% CI: 0.5, 8.4) | 0.28 |
| Holcomb 2020 | Flies in latrine | Any animal MST Marker | 2 | 2 | 8 | 26 | 38 | PR=2.1 (95% CI: 0.5, 8.4) | 0.28 | PR=2.1 (95% CI: 0.5, 8.4) | 0.28 |
| Holcomb 2020 | Flies in latrine | Any bacteria | 1 | 3 | 14 | 20 | 38 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | Flies in latrine | Any virus | 0 | 4 | 5 | 29 | 38 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | Flies in latrine | Any protozoa | 0 | 4 | 3 | 31 | 38 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | Flies in latrine | Any STH | 0 | 4 | 1 | 33 | 38 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | House soil | Any pathogen | 37 | 6 | 43 | 2 | 88 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | House soil | Any MST Marker | 21 | 18 | 26 | 18 | 83 | PR=0.9 (95% CI: 0.6, 1.4) | 0.66 | PR=0.9 (95% CI: 0.6, 1.3) | 0.57 |
| Holcomb 2020 | House soil | Any human MST Marker | 20 | 19 | 26 | 18 | 83 | PR=0.9 (95% CI: 0.6, 1.3) | 0.5 | PR=0.8 (95% CI: 0.5, 1.3) | 0.4 |
| Holcomb 2020 | House soil | Any animal MST Marker | 2 | 37 | 1 | 43 | 83 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | House soil | Any bacteria | 28 | 15 | 35 | 10 | 88 | PR=0.8 (95% CI: 0.6, 1.1) | 0.2 | PR=0.8 (95% CI: 0.6, 1) | 0.09 |
| Holcomb 2020 | House soil | Any virus | 16 | 27 | 22 | 23 | 88 | PR=0.8 (95% CI: 0.5, 1.2) | 0.28 | PR=0.7 (95% CI: 0.5, 1.2) | 0.19 |
| Holcomb 2020 | House soil | Any protozoa | 15 | 28 | 19 | 26 | 88 | PR=0.8 (95% CI: 0.5, 1.4) | 0.49 | PR=0.8 (95% CI: 0.5, 1.4) | 0.49 |
| Holcomb 2020 | House soil | Any STH | 20 | 23 | 34 | 11 | 88 | PR=0.6 (95% CI: 0.4, 0.9) | 0.01 | PR=0.6 (95% CI: 0.4, 0.9) | 0 |
| Holcomb 2020 | Latrine soil | Any MST Marker | 21 | 9 | 22 | 8 | 60 | PR=1 (95% CI: 0.7, 1.3) | 0.78 | PR=1 (95% CI: 0.7, 1.3) | 0.78 |
| Holcomb 2020 | Latrine soil | Any human MST Marker | 21 | 9 | 22 | 8 | 60 | PR=1 (95% CI: 0.7, 1.3) | 0.78 | PR=1 (95% CI: 0.7, 1.3) | 0.78 |
| Holcomb 2020 | Latrine soil | Any animal MST Marker | 2 | 28 | 0 | 30 | 60 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | Source water | Any MST Marker | 1 | 21 | 0 | 19 | 41 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | Source water | Any human MST Marker | 1 | 21 | 0 | 19 | 41 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | Source water | Any animal MST Marker | 0 | 22 | 0 | 19 | 41 | Not estimated |  | Not estimated |  |
| Holcomb 2020 | Stored water | Any MST Marker | 9 | 39 | 6 | 40 | 94 | PR=1.4 (95% CI: 0.5, 4.1) | 0.5 | PR=1.4 (95% CI: 0.5, 4.1) | 0.5 |
| Holcomb 2020 | Stored water | Any human MST Marker | 9 | 39 | 5 | 41 | 94 | PR=1.7 (95% CI: 0.6, 5.2) | 0.33 | PR=1.7 (95% CI: 0.6, 5.2) | 0.33 |
| Holcomb 2020 | Stored water | Any animal MST Marker | 0 | 48 | 1 | 45 | 94 | Not estimated |  | Not estimated |  |
| Fuhrmeister 2020 | Any sample | Any pathogen | 236 | 59 | 261 | 39 | 595 | PR=0.9 (95% CI: 0.9, 1) | 0.02 | PR=0.9 (95% CI: 0.9, 1) | 0.01 |
| Fuhrmeister 2020 | Any sample | Any MST Marker | 282 | 13 | 290 | 10 | 595 | PR=1 (95% CI: 1, 1) | 0.48 | PR=1 (95% CI: 1, 1) | 0.49 |
| Fuhrmeister 2020 | Any sample | Any human MST Marker | 109 | 183 | 119 | 181 | 592 | PR=0.9 (95% CI: 0.8, 1.2) | 0.57 | PR=1 (95% CI: 0.8, 1.2) | 0.67 |
| Fuhrmeister 2020 | Any sample | Any animal MST Marker | 281 | 13 | 289 | 11 | 594 | PR=1 (95% CI: 1, 1) | 0.64 | PR=1 (95% CI: 1, 1) | 0.66 |
| Fuhrmeister 2020 | Any sample | Any bacteria | 233 | 62 | 257 | 43 | 595 | PR=0.9 (95% CI: 0.9, 1) | 0.03 | PR=0.9 (95% CI: 0.9, 1) | 0.03 |
| Fuhrmeister 2020 | Any sample | Any virus | 16 | 223 | 13 | 223 | 475 | PR=1.2 (95% CI: 0.6, 2.4) | 0.56 | PR=1.2 (95% CI: 0.6, 2.3) | 0.7 |
| Fuhrmeister 2020 | Any sample | Any protozoa | 11 | 222 | 15 | 215 | 463 | PR=0.7 (95% CI: 0.3, 1.6) | 0.41 | PR=0.7 (95% CI: 0.3, 1.6) | 0.44 |
| Fuhrmeister 2020 | Child hands | Any pathogen | 75 | 113 | 72 | 116 | 376 | PR=1 (95% CI: 0.8, 1.3) | 0.76 | PR=1.1 (95% CI: 0.8, 1.4) | 0.69 |
| Fuhrmeister 2020 | Child hands | Any MST Marker | 30 | 142 | 44 | 122 | 338 | PR=0.7 (95% CI: 0.4, 1) | 0.04 | PR=0.7 (95% CI: 0.5, 1) | 0.08 |
| Fuhrmeister 2020 | Child hands | Any human MST Marker | 30 | 142 | 44 | 122 | 338 | PR=0.7 (95% CI: 0.4, 1) | 0.04 | PR=0.7 (95% CI: 0.5, 1) | 0.08 |
| Fuhrmeister 2020 | Child hands | Any bacteria | 64 | 122 | 63 | 124 | 373 | PR=1 (95% CI: 0.8, 1.3) | 0.88 | PR=1 (95% CI: 0.8, 1.3) | 0.88 |
| Fuhrmeister 2020 | Child hands | Any virus | 7 | 162 | 7 | 161 | 337 | PR=1 (95% CI: 0.4, 2.7) | 0.99 | PR=1 (95% CI: 0.4, 2.7) | 0.99 |
| Fuhrmeister 2020 | Child hands | Any protozoa | 7 | 147 | 8 | 149 | 311 | PR=0.9 (95% CI: 0.3, 2.4) | 0.82 | PR=0.9 (95% CI: 0.3, 2.4) | 0.82 |
| Fuhrmeister 2020 | House soil | Any pathogen | 209 | 141 | 224 | 136 | 710 | PR=1 (95% CI: 0.9, 1.1) | 0.53 | PR=0.9 (95% CI: 0.8, 1.1) | 0.32 |
| Fuhrmeister 2020 | House soil | Any MST Marker | 274 | 38 | 284 | 33 | 629 | PR=1 (95% CI: 0.9, 1) | 0.7 | PR=1 (95% CI: 0.9, 1) | 0.49 |
| Fuhrmeister 2020 | House soil | Any human MST Marker | 68 | 243 | 59 | 261 | 631 | PR=1.2 (95% CI: 0.9, 1.6) | 0.28 | PR=1.2 (95% CI: 0.9, 1.7) | 0.18 |
| Fuhrmeister 2020 | House soil | Any animal MST Marker | 272 | 30 | 278 | 27 | 607 | PR=1 (95% CI: 0.9, 1) | 0.82 | PR=1 (95% CI: 0.9, 1) | 0.59 |
| Fuhrmeister 2020 | House soil | Any bacteria | 209 | 141 | 224 | 136 | 710 | PR=1 (95% CI: 0.9, 1.1) | 0.53 | PR=0.9 (95% CI: 0.8, 1.1) | 0.32 |
| Fuhrmeister 2020 | Mother's hands | Any pathogen | 96 | 266 | 110 | 267 | 739 | PR=0.9 (95% CI: 0.7, 1.2) | 0.43 | PR=0.9 (95% CI: 0.7, 1.2) | 0.47 |
| Fuhrmeister 2020 | Mother's hands | Any MST Marker | 346 | 14 | 359 | 9 | 728 | PR=1 (95% CI: 1, 1) | 0.26 | PR=1 (95% CI: 1, 1) | 0.29 |
| Fuhrmeister 2020 | Mother's hands | Any human MST Marker | 58 | 268 | 60 | 265 | 651 | PR=1 (95% CI: 0.7, 1.4) | 0.84 | PR=1 (95% CI: 0.7, 1.4) | 0.82 |
| Fuhrmeister 2020 | Mother's hands | Any animal MST Marker | 344 | 15 | 358 | 9 | 726 | PR=1 (95% CI: 1, 1) | 0.17 | PR=1 (95% CI: 1, 1) | 0.19 |
| Fuhrmeister 2020 | Mother's hands | Any bacteria | 81 | 281 | 96 | 279 | 737 | PR=0.9 (95% CI: 0.7, 1.1) | 0.3 | PR=0.9 (95% CI: 0.7, 1.1) | 0.2 |
| Fuhrmeister 2020 | Mother's hands | Any virus | 11 | 320 | 9 | 318 | 658 | PR=1.1 (95% CI: 0.5, 2.6) | 0.83 | PR=1.2 (95% CI: 0.5, 2.8) | 0.75 |
| Fuhrmeister 2020 | Mother's hands | Any protozoa | 5 | 296 | 9 | 292 | 602 | PR=0.6 (95% CI: 0.1, 2.1) | 0.39 | PR=0.6 (95% CI: 0.1, 2.1) | 0.39 |
| Fuhrmeister 2020 | Stored water | Any pathogen | 138 | 218 | 148 | 237 | 741 | PR=1 (95% CI: 0.8, 1.2) | 0.93 | PR=1 (95% CI: 0.8, 1.2) | 1 |
| Fuhrmeister 2020 | Stored water | Any MST Marker | 230 | 119 | 256 | 119 | 724 | PR=1 (95% CI: 0.9, 1.1) | 0.52 | PR=1 (95% CI: 0.9, 1.1) | 0.65 |
| Fuhrmeister 2020 | Stored water | Any human MST Marker | 5 | 310 | 12 | 324 | 651 | PR=0.4 (95% CI: 0.2, 1.2) | 0.12 | PR=0.4 (95% CI: 0.2, 1.2) | 0.12 |
| Fuhrmeister 2020 | Stored water | Any animal MST Marker | 229 | 113 | 253 | 109 | 704 | PR=1 (95% CI: 0.9, 1.1) | 0.43 | PR=1 (95% CI: 0.9, 1.1) | 0.6 |
| Fuhrmeister 2020 | Stored water | Any bacteria | 138 | 218 | 148 | 237 | 741 | PR=1 (95% CI: 0.8, 1.2) | 0.93 | PR=1 (95% CI: 0.8, 1.2) | 1 |
| Steinbaum 2019 | Any sample | Any pathogen | 205 | 968 | 169 | 700 | 2,042 | PR=0.9 (95% CI: 0.7, 1.1) | 0.29 | PR=0.9 (95% CI: 0.7, 1.1) | 0.31 |
| Steinbaum 2019 | Any sample | Any STH | 205 | 968 | 169 | 700 | 2,042 | PR=0.9 (95% CI: 0.7, 1.1) | 0.29 | PR=0.9 (95% CI: 0.7, 1.1) | 0.31 |
| Steinbaum 2019 | House soil | Any pathogen | 208 | 988 | 169 | 718 | 2,083 | PR=0.9 (95% CI: 0.7, 1.1) | 0.35 | PR=0.9 (95% CI: 0.7, 1.1) | 0.37 |
| Steinbaum 2019 | House soil | Any STH | 208 | 988 | 169 | 718 | 2,083 | PR=0.9 (95% CI: 0.7, 1.1) | 0.35 | PR=0.9 (95% CI: 0.7, 1.1) | 0.37 |
| Reese 2017 | Any sample | Any pathogen | 185 | 792 | 238 | 825 | 2,040 | PR=0.8 (95% CI: 0.7, 1.1) | 0.18 | PR=0.9 (95% CI: 0.7, 1.1) | 0.21 |
| Reese 2017 | Any sample | Any bacteria | 185 | 792 | 238 | 825 | 2,040 | PR=0.8 (95% CI: 0.7, 1.1) | 0.18 | PR=0.9 (95% CI: 0.7, 1.1) | 0.21 |
| Reese 2017 | Source water | Any pathogen | 68 | 588 | 122 | 747 | 1,525 | PR=0.7 (95% CI: 0.5, 1.1) | 0.15 | PR=0.7 (95% CI: 0.5, 1.1) | 0.16 |
| Reese 2017 | Source water | Any bacteria | 68 | 588 | 122 | 747 | 1,525 | PR=0.7 (95% CI: 0.5, 1.1) | 0.15 | PR=0.7 (95% CI: 0.5, 1.1) | 0.16 |
| Reese 2017 | Stored water | Any pathogen | 134 | 786 | 147 | 860 | 1,927 | PR=1 (95% CI: 0.8, 1.3) | 0.99 | PR=1 (95% CI: 0.8, 1.3) | 0.94 |
| Reese 2017 | Stored water | Any bacteria | 134 | 786 | 147 | 860 | 1,927 | PR=1 (95% CI: 0.8, 1.3) | 0.99 | PR=1 (95% CI: 0.8, 1.3) | 0.94 |
| Boehm 2016 | Any sample | Any pathogen | 18 | 225 | 15 | 226 | 484 | PR=1.3 (95% CI: 0.6, 2.7) | 0.53 | PR=1.2 (95% CI: 0.6, 2.5) | 0.62 |
| Boehm 2016 | Any sample | Any MST Marker | 246 | 2 | 244 | 5 | 497 | Not estimated |  | Not estimated |  |
| Boehm 2016 | Any sample | Any general MST Marker | 230 | 16 | 229 | 16 | 491 | PR=1 (95% CI: 1, 1) | 0.99 | PR=1 (95% CI: 1, 1.1) | 0.92 |
| Boehm 2016 | Any sample | Any human MST Marker | 26 | 222 | 26 | 223 | 497 | PR=1 (95% CI: 0.6, 1.8) | 0.99 | PR=1 (95% CI: 0.6, 1.8) | 0.99 |
| Boehm 2016 | Any sample | Any animal MST Marker | 214 | 29 | 216 | 25 | 484 | PR=1 (95% CI: 0.9, 1.1) | 0.88 | PR=1 (95% CI: 0.9, 1) | 0.48 |
| Boehm 2016 | Any sample | Any virus | 18 | 225 | 15 | 226 | 484 | PR=1.3 (95% CI: 0.6, 2.7) | 0.53 | PR=1.2 (95% CI: 0.6, 2.5) | 0.62 |
| Boehm 2016 | Child hands | Any pathogen | 15 | 227 | 14 | 224 | 480 | PR=1.1 (95% CI: 0.5, 2.5) | 0.75 | PR=1 (95% CI: 0.5, 2.3) | 0.91 |
| Boehm 2016 | Child hands | Any MST Marker | 141 | 101 | 143 | 95 | 480 | PR=1 (95% CI: 0.8, 1.2) | 0.78 | PR=1 (95% CI: 0.8, 1.1) | 0.71 |
| Boehm 2016 | Child hands | Any human MST Marker | 7 | 240 | 5 | 241 | 493 | PR=1.4 (95% CI: 0.5, 4.2) | 0.56 | PR=1.4 (95% CI: 0.5, 4.2) | 0.56 |
| Boehm 2016 | Child hands | Any animal MST Marker | 140 | 102 | 142 | 96 | 480 | PR=1 (95% CI: 0.8, 1.2) | 0.78 | PR=1 (95% CI: 0.8, 1.1) | 0.67 |
| Boehm 2016 | Child hands | Any virus | 15 | 227 | 14 | 224 | 480 | PR=1.1 (95% CI: 0.5, 2.5) | 0.75 | PR=1 (95% CI: 0.5, 2.3) | 0.91 |
| Boehm 2016 | House soil | Any pathogen | 5 | 242 | 2 | 247 | 496 | Not estimated |  | Not estimated |  |
| Boehm 2016 | House soil | Any MST Marker | 180 | 67 | 187 | 62 | 496 | PR=1 (95% CI: 0.9, 1.1) | 0.59 | PR=1 (95% CI: 0.9, 1.1) | 0.58 |
| Boehm 2016 | House soil | Any human MST Marker | 21 | 226 | 23 | 226 | 496 | PR=0.9 (95% CI: 0.5, 1.7) | 0.79 | PR=0.9 (95% CI: 0.5, 1.8) | 0.84 |
| Boehm 2016 | House soil | Any animal MST Marker | 178 | 69 | 186 | 63 | 496 | PR=1 (95% CI: 0.9, 1.1) | 0.53 | PR=1 (95% CI: 0.9, 1.1) | 0.51 |
| Boehm 2016 | House soil | Any virus | 5 | 242 | 2 | 247 | 496 | Not estimated |  | Not estimated |  |
| Boehm 2016 | Stored water | Any pathogen | 2 | 243 | 1 | 245 | 491 | Not estimated |  | Not estimated |  |
| Boehm 2016 | Stored water | Any MST Marker | 228 | 16 | 230 | 15 | 489 | PR=1 (95% CI: 0.9, 1) | 0.85 | PR=1 (95% CI: 1, 1) | 0.91 |
| Boehm 2016 | Stored water | Any general MST Marker | 230 | 16 | 229 | 16 | 491 | PR=1 (95% CI: 1, 1) | 0.99 | PR=1 (95% CI: 1, 1.1) | 0.92 |
| Boehm 2016 | Stored water | Any human MST Marker | 0 | 245 | 0 | 246 | 491 | Not estimated |  | Not estimated |  |
| Boehm 2016 | Stored water | Any animal MST Marker | 55 | 185 | 80 | 158 | 478 | PR=0.7 (95% CI: 0.5, 1) | 0.03 | PR=0.7 (95% CI: 0.5, 0.9) | 0.02 |
| Boehm 2016 | Stored water | Any virus | 2 | 243 | 1 | 245 | 491 | Not estimated |  | Not estimated |  |
| Odagiri 2016 | Any sample | Any pathogen | 12 | 18 | 15 | 15 | 60 | PR=0.8 (95% CI: 0.4, 1.4) | 0.45 |  |  |
| Odagiri 2016 | Any sample | Any MST Marker | 25 | 5 | 25 | 5 | 60 | PR=1 (95% CI: 0.8, 1.3) | 1 |  |  |
| Odagiri 2016 | Any sample | Any general MST Marker | 23 | 7 | 23 | 7 | 60 | PR=1 (95% CI: 0.8, 1.3) | 1 |  |  |
| Odagiri 2016 | Any sample | Any human MST Marker | 22 | 8 | 21 | 9 | 60 | PR=1 (95% CI: 0.8, 1.4) | 0.78 |  |  |
| Odagiri 2016 | Any sample | Any bacteria | 8 | 22 | 11 | 19 | 60 | PR=0.7 (95% CI: 0.3, 1.6) | 0.42 |  |  |
| Odagiri 2016 | Any sample | Any virus | 7 | 23 | 10 | 20 | 60 | PR=0.7 (95% CI: 0.3, 1.6) | 0.4 |  |  |
| Odagiri 2016 | Stored water | Any pathogen | 12 | 18 | 15 | 15 | 60 | PR=0.8 (95% CI: 0.4, 1.4) | 0.45 |  |  |
| Odagiri 2016 | Stored water | Any MST Marker | 25 | 5 | 25 | 5 | 60 | PR=1 (95% CI: 0.8, 1.3) | 1 |  |  |
| Odagiri 2016 | Stored water | Any general MST Marker | 23 | 7 | 23 | 7 | 60 | PR=1 (95% CI: 0.8, 1.3) | 1 |  |  |
| Odagiri 2016 | Stored water | Any human MST Marker | 22 | 8 | 21 | 9 | 60 | PR=1 (95% CI: 0.8, 1.4) | 0.78 |  |  |
| Odagiri 2016 | Stored water | Any bacteria | 8 | 22 | 11 | 19 | 60 | PR=0.7 (95% CI: 0.3, 1.6) | 0.42 |  |  |
| Odagiri 2016 | Stored water | Any virus | 7 | 23 | 10 | 20 | 60 | PR=0.7 (95% CI: 0.3, 1.6) | 0.4 |  |  |

## Table S7.

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** | **Kwong 2021** |
| --- | --- | --- | --- | --- | --- | --- |
| Household wealth |  |  |  |  |  |  |
| 1 | 6197 (27.3%) | 4539 (19.7%) | 6964 (27.8%) | 10328 (24.3%) | 2476 (24.4%) | 4086 (24.3%) |
| 2 | 5954 (26.2%) | 4454 (19.3%) | 7007 (28.0%) | 10118 (23.8%) | 2764 (27.2%) | 4476 (26.6%) |
| 3 | 5615 (24.7%) | 4591 (19.9%) | 5738 (22.9%) | 10615 (25.0%) | 1791 (17.6%) | 4278 (25.5%) |
| 4 | 4974 (21.9%) | 4714 (20.5%) | 5299 (21.2%) | 11472 (27.0%) | 2170 (21.4%) | 3966 (23.6%) |
| Missing | 0 (0%) | 4728 (20.5%) | 24 (0.1%) | 0 (0%) | 955 (9.4%) | 0 (0%) |
| Number of people in the household |  |  |  |  |  |  |
| <5 | 12397 (54.5%) | 1451 (6.3%) | 7240 (28.9%) | 23187 (54.5%) | 2824 (27.8%) | 9426 (56.1%) |
| 5-8 | 9125 (40.1%) | 17171 (74.6%) | 13630 (54.5%) | 16615 (39.1%) | 4156 (40.9%) | 6360 (37.8%) |
| >8 | 1218 (5.4%) | 4404 (19.1%) | 2950 (11.8%) | 2731 (6.4%) | 2259 (22.2%) | 1020 (6.1%) |
| Missing | 0 (0%) | 0 (0%) | 1212 (4.8%) | 0 (0%) | 917 (9.0%) | 0 (0%) |
| Number of rooms in the household |  |  |  |  |  |  |
| 1-2 | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 4707 (46.3%) | 0 (0%) |
| >3 | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 4494 (44.2%) | 0 (0%) |
| Missing | 22740 (100%) | 23026 (100%) | 25032 (100%) | 42533 (100%) | 955 (9.4%) | 16806 (100%) |
| Improved wall |  |  |  |  |  |  |
| 0 | 3588 (15.8%) | 0 (0%) | 23976 (95.8%) | 14372 (33.8%) | 1834 (18.1%) | 4428 (26.3%) |
| 1 | 19152 (84.2%) | 0 (0%) | 1056 (4.2%) | 28161 (66.2%) | 7367 (72.5%) | 12378 (73.7%) |
| Missing | 0 (0%) | 23026 (100%) | 0 (0%) | 0 (0%) | 955 (9.4%) | 0 (0%) |
| Improved floor |  |  |  |  |  |  |
| 0 | 21083 (92.7%) | 0 (0%) | 23732 (94.8%) | 37857 (89.0%) | 233 (2.3%) | 15084 (89.8%) |
| 1 | 1657 (7.3%) | 0 (0%) | 1300 (5.2%) | 4676 (11.0%) | 8968 (88.3%) | 1722 (10.2%) |
| Missing | 0 (0%) | 23026 (100%) | 0 (0%) | 0 (0%) | 955 (9.4%) | 0 (0%) |
| Improved roof |  |  |  |  |  |  |
| 0 | 368 (1.6%) | 0 (0%) | 8164 (32.6%) | 464 (1.1%) | 0 (0%) | 276 (1.6%) |
| 1 | 22372 (98.4%) | 0 (0%) | 16868 (67.4%) | 42069 (98.9%) | 0 (0%) | 16530 (98.4%) |
| Missing | 0 (0%) | 23026 (100%) | 0 (0%) | 0 (0%) | 10156 (100%) | 0 (0%) |
| Electricity |  |  |  |  |  |  |
| 0 | 10690 (47.0%) | 3780 (16.4%) | 23266 (92.9%) | 17191 (40.4%) | 676 (6.7%) | 7020 (41.8%) |
| 1 | 12050 (53.0%) | 18812 (81.7%) | 1742 (7.0%) | 25342 (59.6%) | 8563 (84.3%) | 9786 (58.2%) |
| Missing | 0 (0%) | 434 (1.9%) | 24 (0.1%) | 0 (0%) | 917 (9.0%) | 0 (0%) |
| Father in agriculture |  |  |  |  |  |  |
| 0 | 15188 (66.8%) | 10778 (46.8%) | 0 (0%) | 29446 (69.2%) | 0 (0%) | 11466 (68.2%) |
| 1 | 7552 (33.2%) | 9489 (41.2%) | 0 (0%) | 13087 (30.8%) | 0 (0%) | 5340 (31.8%) |
| Missing | 0 (0%) | 2759 (12.0%) | 25032 (100%) | 0 (0%) | 10156 (100%) | 0 (0%) |
| Land owned |  |  |  |  |  |  |
| 0 | 0 (0%) | 8718 (37.9%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
| 1 | 0 (0%) | 11486 (49.9%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |
| Missing | 22740 (100%) | 2822 (12.3%) | 25032 (100%) | 42533 (100%) | 10156 (100%) | 16806 (100%) |
| Acres of land owned |  |  |  |  |  |  |
| Mean (SD) | 0.111 (0.129) | NA (NA) | NA (NA) | 0.153 (0.200) | 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] | 0.0800 [0.0100, 3.15] |
| Missing | 598 (2.6%) | 23026 (100%) | 25032 (100%) | 1623 (3.8%) | 10156 (100%) | 744 (4.4%) |
| Maternal education |  |  |  |  |  |  |
| No education | 3904 (17.2%) | 0 (0%) | 0 (0%) | 6016 (14.1%) | 381 (3.8%) | 2484 (14.8%) |
| Incomplete Primary | 0 (0%) | 9113 (39.6%) | 12892 (51.5%) | 0 (0%) | 4203 (41.4%) | 0 (0%) |
| Primary | 8228 (36.2%) | 2401 (10.4%) | 6028 (24.1%) | 12909 (30.4%) | 1538 (15.1%) | 5424 (32.3%) |
| Secondary | 10608 (46.6%) | 6205 (26.9%) | 5940 (23.7%) | 23608 (55.5%) | 2953 (29.1%) | 8898 (52.9%) |
| More than secondary | 0 (0%) | 685 (3.0%) | 0 (0%) | 0 (0%) | 28 (0.3%) | 0 (0%) |
| Missing | 0 (0%) | 4622 (20.1%) | 172 (0.7%) | 0 (0%) | 1053 (10.4%) | 0 (0%) |
| Maternal age |  |  |  |  |  |  |
| Mean (SD) | 23.7 (5.18) | NA (NA) | 26.4 (6.33) | 23.7 (5.07) | 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] | 24.0 [15.0, 43.0] |
| Missing | 0 (0%) | 23026 (100%) | 280 (1.1%) | 0 (0%) | 10156 (100%) | 24 (0.1%) |