Additional file 1: The socio-demographic characteristics of mothers and Under-five children in Northwest, Ethiopia, 2019

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| Variables | Frequency (N=422)  | Percent (%) |
| Age of mothers(year)  | 16-27  | 106 | 25.1 |
| 28-33 | 109 | 25.8 |
| 34-42 | 107 | 25.4 |
| 43-80 | 100 | 23.7 |
| Religion of mother | Orthodox | 264 | 62.6 |
| Muslim | 97 | 23.0 |
| Protestant | 49 | 11.6 |
| Catholic | 9 | 2.1 |
| Others | 3  | 0.7 |
| Family monthly income (ETB) | <500 | 257 | 60.9 |
| 500-2500 | 47 | 11.1 |
| 2501-3500 | 36 | 8.5 |
| 3501-5100 | 41 | 9.7 |
| 5101+ | 41 | 9.7 |
| Educational status of mothers | Illiterate  | 122  | 28.9 |
| Literate  | 300 | 71.1 |
| Sex of child | Male | 211  | 50.0 |
| Female | 211 | 50.0 |
| Place of residence  | Urban | 238 | 56.4 |
| Rural | 184 | 43.6 |
| Age of children in Month | 2-26 | 108 | 25.6 |
| 27-36 | 107 | 25.4 |
| 37-46 | 110 | 26.1 |
| 47+ | 97 | 22.9 |
| Marital Status  | Unmarried  | 179 | 42.4 |
| Married | 243 | 57.6 |

**Additional file 2: The primary source of information of mother’s about hand washing practice in Northwest Ethiopia, 2019**



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| **Additional file 3: hand washing practice of mothers in Northwest Ethiopia, 2019** |  |
| Items  | Always  | Usually | Sometimes | Never |
| N (%)  | N (%) | N (%) | N (%) |
| Do you wash your hands after using toilet? | 274(64.9) | 120 (28.4) | 26 (6.2) | 2 (0.5) |
| Do you wash your hands before eating meal? | 364(86.3) | 38 (9.0) | 16 (3.8) | 4 (0.9) |
| Do you use chemicals when you are washing your hands? | 113(26.8) | 53 (12.6) | 120 (28.4) | 136 (32.2) |
| I always remind the children to wash hands before eating? | 229(54.3) | 101 (23.9) | 88 (20.9) | 4 (0.9) |
| I always remind the children to wash hands after eating | 226(53.6) | 100 (23.7) | 94 (22.3) | 2 (0.5) |
| I wash hands after interacting with children/ sick person  | 84 (19.9) | 81 (19.2) | 219 (51.9) | 38 (9.0) |
| I always wash my hands before and after handling raw material such as vegetables/ chicken/mutton etc. | 74 (17.5) | 77 (18.2) | 218 (51.7) | 53 (12.6) |
| I wipe my wet hands until dry  | 68 (16.1) | 47 (11.1) | 185 (43.8) | 122 (28.9) |
| Washing hands with soap is my routine practice  | 161(38.2) | 157 (37.2) | 94 (22.3) | 10 (2.4) |
| **Hand washing methods**  | Frequency  | Percent  |
| Washing hands by Water only | 87 | 20.6 |
| Washing hands by Water and grass  | 3 | 0.7 |
| Washing hands by Water and ash | 28 | 6.6 |
| Washing hands by Water and soap/detergent | 304 | 72 |
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| **Additional file 4: the correlation of health outcomes of under-five children and mother’s hand washing practice in Northwest Ethiopia, 2019** |
| **Health outcomes of under-five children** | **Hand washing practice of mothers** | **P-value**  |
| Good | Poor |
| Diarrheal disease  | Yes  | 62 | 65 | 0.001 |
| No  | 103 | 192 |
| Acute respiratory tract infection (ARTI)  | Yes  | 42 | 73 | 0.5 |
| No  | 123 | 184 |
| Meningitis  | Yes  | 17 | 28 | 0.84 |
| No  | 148 | 229 |
| Malnutrition | Yes  | 32 | 71 | 0.05 |
|
| No  | 133 | 186 |
| Other childhood illness  | Yes  | 27 | 39 | 0.74 |
| No  | 138 | 218 |