



Baseline Survey on Water, Sanitation, Hygiene and Related Neglected Tropical Diseases

MANNI AND BOGANDE DISTRICTS IN GNAGNA PROVINCE,
BURKINA FASO

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INFORMATION ON WASHPLUS

WASHplus supports healthy households and communities by creating and delivering interventions that lead to improvements in access to water, sanitation, and hygiene (WASH), and that reduce or prevent neglected tropical diseases. This multi-year project (2010-2016), funded through USAID's Bureau for Global Health and led by FHI 360, in partnership with CARE and Winrock International, provides the implementation at scale of a WASH program to support efforts against three endemic tropical diseases (trachoma, schistosomiasis, and soil transmitted helminths) in Burkina Faso.

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ACRONYMS

CERS	Comité d’Ethique pour la Recherche en Santé
CLTS	Community-Led Total Sanitation
CSPS	Centre sanitaire et promotion social
CRSN	Centre de Recherche en Santé de Nouna
FHI 360	Family Health International
HID	High Intervention District
HIV-AIDS	Human Immunodeficiency Virus- Acquired Immune Deficiency Syndrome
IEC	Information, Education, and Communication
LID	Low Intervention District
LIS	Labor Intensive Services
MARSHA	Ministry of Agriculture, Water Resources, Sanitation and Food Security
MDA	Mass Drug Administration
NGO	Nongovernmental Organization
NTDs	Neglected Tropical Diseases
ODF	Open Defecation Free
ODK	Open Data Kit
ONEA	Office National de l’Eau et de l’Assainissement
PN-AEPA	National Program of Potable Water and Sanitation Services
PNMTN	National NTD Program
REGIS-ER	Resilience Economic Growth in Sahel – Enhanced Resilience
SAFE	Surgery, Antibiotic, Facial Cleanliness and Environmental Change
SES	Socio-Economic Status
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund

USAID	United States Agency for International Development
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization
WUA	Water Users Association

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EXECUTIVE SUMMARY

This report presents the results of a baseline comparative study conducted in two districts, Manni, a high intervention district (HID), and Bogandé, a low intervention district (LID). Both districts are located in Gnagna Province in Burkina Faso. The baseline survey interviewed 1,296 caregivers of children aged one to nine years. It was conducted to obtain a better understanding of the situation in these two districts with regard to water, sanitation, and hygiene (WASH), and related neglected tropical diseases (NTDs). This made it possible to collect useful baseline information for 1) better orientation and prioritizing of future integrated WASH-NTD investments and interventions and 2) the integration of these interventions with existing NTD programs in the region.

Specifically, the baseline survey of mothers or caregivers of children aged one to nine years allowed researchers to assess their current behavior and hygiene practices regarding the reduction of trachoma, schistosomiasis, and soil-transmitted helminths. It was also possible to identify points of access and sources of drinking water and improved sanitation. Finally, the survey described the various information channels and assessed households' level of exposure to information related to promoting appropriate hygiene practices to reduce or suppress these three major infectious diseases.

Key Findings

Similarities in socio-demographic characteristics of the respondents exist as do disparities in economic characteristics between households. The demographic and socio-economic characteristics of respondents and households surveyed are almost similar for the two districts. Variations exist in the type of floors (86% of the floors of the houses were made of clay in Manni and 70% ($p < 0.05$) in Bogandé); the means of cooking foodstuffs (the proportion of households using fixed or removable improved stoves in Manni is almost twice as much as in Bogandé); and especially the nature of income-generating activities. For instance, there were more farmers during the month of the survey in Manni (81%) than Bogandé (22%, ($p < 0.05$)), and fewer husbands working as gold miners in Manni (11%) than Bogandé (24% [$p < 0.05$]).

Satisfactory access to an improved water source and adequate water storage method are practiced, but techniques for treating drinking water at home should be reinforced.

Drinking water used by households surveyed in both districts is mainly collected from an improved source (in most cases from a borehole or a well) by 75 percent of households in Manni and by 81 percent of households in Bogandé.

However, among households using an unimproved water source (mainly surface water or unprotected wells), 96 percent of them do not treat their drinking water in Manni compared to 76 percent ($p < 0.05$) in Bogandé.

In general, containers used to store drinking water at home are adequate in both districts; about nine of ten households use containers with a narrow spout and a cover to store water at home.

The common factor to both districts associated with access to an improved water source is the ability to read without difficulty (exp (β) = 3.63 $p < 0.05$ in Manni and 5.06 in Bogandé, $p < 0.05$). However, in Manni, improved water sources in the vicinity are more accessible to affluent households (exp (β) ≥ 1.82 $p < 0.05$) and to women who have received information on the treatment of drinking water (exp (β) = 2.33 $p < 0.05$), while in Bogandé, it is more accessible to the Christian households (exp (β) = 3.79 $p < 0.05$).

Lack of sanitation infrastructure: management of human excreta should be strengthened.

The results of this study show that, even though the populations of the two districts lack sanitation and hygiene infrastructure, 51 percent of households use improved latrines in Manni compared to 32 percent ($p < 0.05$) in Bogandé. Because of a lack of latrines, about 47 percent of households in Manni still practice open air defecation compared to 65 percent ($p < 0.05$) in Bogandé.

The determinants of access to improved latrines vary between districts. In Manni latrines are more accessible to affluent households (exp (β) ≥ 2.05 $p < 0.05$), Christian households (exp (β) = 2.61 $p \leq 0.05$), women between 21 and 40 years (exp (β) ≥ 1.83 $p < 0.05$), and to those exposed to information about using latrines (exp (β) = 2.39 $p < 0.05$). In Bogandé Christians and women who can read without difficulty have more access to improved latrines (exp (β) = 2.69 $p < 0.05$).

Moreover, hygienic methods of young child feces disposal, which consists of pouring infant feces into a latrine, is not yet optimal in the two districts; only 39 percent of caregivers of young children practice it in Manni compared to 23 percent ($p < 0.05$) in Bogandé.

The availability of soap at home is relatively good, but practice of handwashing with soap at some key moments should be reinforced. In both districts, although the presence of soap was observed in eight households out of ten, its use for handwashing at the five key moments is not yet systematic for most caregivers; nearly four women out of ten say they do not wash their hands with soap at the key times.

Inadequate handwashing systems should be modified. *Typical handwashing system used:*

In both districts, only two households out of ten have a specific place in their compound for handwashing. Very few of them, as low as 5 percent in Manni use a fixed tippy tap, while none were found in Bogandé. In Manni 56 percent of handwashing systems are equipped with water and soap compared to 33 percent ($p < 0.05$) in Bogandé.

Handwashing system located near latrines: Among households that have access to latrines, about 17 percent have equipped their latrines with handwashing systems in Manni compared to 13 percent in Bogandé. In both districts, no fixed handwashing system is near the latrines. However, 15 percent of handwashing systems observed in Manni are equipped with soap and water compared to 11 percent in Bogandé.

Satisfactory knowledge about trachoma and cleanliness or hygiene of the face should be maintained or even enhanced. In both districts, children’s caregivers acknowledge the crucial role of trachoma, and the importance of face washing in preventing blindness. Most women report having washed the face of their child at least once a day. Thus most children aged between one and nine have a clean face, very few have ocular or nasal discharge, and no presence of flies or foodstuffs around their mouth was noted at the time of observation. Furthermore, 82 percent of women surveyed in Manni do not dry the face of their children after washing it compared to 74 percent in Bogandé.

Satisfactory knowledge about schistosomiasis, some risky practices should be improved. Although caregivers recognize the importance of reducing contact with contaminated water in the prevention of schistosomiasis, the use of latrines by children for urination is far from being a common practice; about one child in ten used them during urination in both districts. Furthermore, 69 percent of women in Manni and 75 percent in Bogandé do not know the frequency with which their children swim in or play near a pond.

Some key knowledge of soil-transmitted helminths and appropriate prevention behavior exists. Although most caregivers cited food hygiene as the main action for preventing soil-transmitted helminths, very few know some related key behaviors that should be adopted. For example, 13 percent of women in Manni cited not defecating in the open compared to 35 percent ($p < 0.05$) in Bogandé; 8 percent mentioned ensuring the cleanliness of latrines in Manni compared to 29 percent ($p < 0.05$) in Bogandé; 7 percent of women cited wearing shoes in Manni compared to 40 percent ($p < 0.05$) in Bogandé; and similarly 7 percent of women in Manni reported not eating on the floor compared to 20 percent in Bogandé.

However, 71 percent of caregivers in Manni say their children always wear shoes when they leave the house compared to 50 percent ($p < 0.05$) in Bogandé. From our observation about eight out of ten latrines are clean (relatively or very clean) in the two districts, and in Manni 26 percent of women serve their children food on the bare floor at home compared to 31 percent in Bogandé.

Cleanliness of the household environment should be improved. Factors that favor the abundance of certain NTD transmission vectors are usually present around or in the vicinity of households. Indeed, the presence of human and animal feces was observed in 76 percent of compounds in Manni and in 54 percent ($p < 0.05$) of compounds in Bogandé, and the presence of livestock excreta near the houses was observed in 72 percent of households in Manni and in 54 percent ($p < 0.05$) households in Bogandé.

Information channels for large-scale or mass sensitization campaigns should be included in a communication strategy. To reduce the risks of re-infection or transmission of trachoma, schistosomiasis, and soil-transmitted helminths among households in the study, it is necessary to implement integrated interventions that promote best practices of WASH with measures to fight NTDs, especially the relevant behaviors contributing to preventing the three NTDs. Thus,

the results show that radio, health workers, and community health workers are the most suitable channels for disseminating messages to inform, educate, and raise awareness. Furthermore, mass drug administration (MDA) sessions that distribute NTD drugs to large population groups were mentioned by a relatively small proportion of caregivers, but may be key and interesting contact moments for officials involved in the fight against NTDs to disseminate sensitization messages, and thus reduce missed opportunities.

INTRODUCTION

Seventeen communicable and debilitating diseases are prioritized as neglected tropical diseases (NTDs). They are mostly parasitic (e.g., schistosomiasis and soil-transmitted helminths), bacterial (trachoma), and to a lesser degree viral (dengue). They were long forgotten or neglected in favor of diseases such as HIV-AIDS, malaria, and tuberculosis, the big three diseases that have received massive investment from the Global Fund.

Realizing the heavy health and economic toll (King 2008, World Health Organization [WHO] 2008) of NTDs on the poorest countries, the international community, under the auspices of the WHO, strongly mobilized in 2012 (UnitingtoCombatNTDs 2013). A global plan was defined to fight these diseases with targets set for 2020 and 2030 (WHO 2012). The international community committed itself primarily to saving lives (Conteh 2010, UnitingtoCombatNTDs 2012) from these "serial killers" threatening thousands of adult women and school and preschool-aged children (Conteh 2010), the majority of whom still live in remote and inaccessible areas, where the health system is failing, the supply of water remains inadequate and limited, and the sanitation environment is very precarious.

The WHO (2011) has already taken the initiative and endorsed the implementation of proven effective strategies, such as SAFE (surgery, antibiotics, facial cleanliness, environmental improvements) in the fight against trachoma (Robin 2001) or chemoprevention, to control or eradicate these diseases that in turn will combat the poverty that they perpetuate in countries where they are present. Indeed, NTDs are both the consequences, because their emergence or re-emergence results from extreme poverty, and the causes of poverty. Since they hamper the productivity of the population, thus causing very substantial economic losses, and induce exorbitant intervention costs (Ramaiah et al 2000, Montresor et al 2010), they further weaken the economic system of the poorest and lowest income countries where they are rife.

Burkina Faso, like many developing countries in Africa, is an ideal place for NTD transmission because of its extreme poverty. The country is one of the poorest in the world (UNDP 2014) owing to the Sudano-Sahelian climate, which negatively impacts on resources and permanent access to drinking water (Grouzis 1989), its deficient health system (PNDS 2011), and risky behavioral practices resulting from poor hygiene habits of a large part of the population living mainly in rural areas.

In Burkina Faso, the statistics on NTDs, sanitation, and water are surprising. On the health front, five NTDs are still endemic: trachoma, telluric or soil-transmitted helminths, schistosomiasis, lymphatic filariasis (LF), and onchocerciasis. The magnitude of these diseases, to mention only the first three, is disturbing. Nearly half of the population, 46 percent (WHO 2014) lives in areas where trachoma is endemic, 61 percent live where schistosomiasis is widespread, and 57 percent where soil helminths are rife (ENVISION 2015). On the sanitation front, some risky practices are common in rural areas where 75 percent of households still practice open defecation, compared

to only 9 percent in urban areas. Conversely, only 7 percent of rural households use improved latrines, compared to 50 percent for urban households. More than 70 percent of urban and rural households have access to an improved source of drinking water (particularly boreholes or wells). However, in rural areas, the water source is not located in the compound or near the house, while in urban areas 27 percent of households report having a water source inside or near their house (WHO-UNICEF 2015).

To fight NTDs, the government plans to operationalize national master plans and the National Plan for Water Supply and Sanitation (PN - AEPA) (PNAEPA 2009). The Ministry of Health and its decentralized agencies are assigned to implement master plans. The water and sanitation sectors are governed by a framework law established in 2001 (faolex.fao.org) and the PN-AEPA. In urban areas, the National Office of Water and Sanitation (ONEA) manages the domestic water demand through ONEA centers and simplified drinking water supply systems, as well as sanitation. In rural areas, these are managed by municipalities with technical assistance from decentralized agencies of the Ministry of Agriculture, Water Resources, Sanitation and Food Security (MARSHA). They work closely with local communities and NGOs through village water supply projects for the installation of wells, water pumps, and boreholes to ensure drinking water supply (Carl 2001). They have also started promoting community-led total sanitation (CLTS) (UNICEF 2013) to stop open defecation through the construction and use of improved latrines. For example, the municipalities of Manni and Gnagna in the Bogandé region are beneficiaries of CLTS activities implemented by different NGOs, such as Helvetas (Helvetas 2011) and Sani-East (formerly known as Sani-Faso) (IRC 2012).

Furthermore, the PN-AEPA, includes an education component on WASH specifically highlighting the relationship between drinking water, sanitation, and the health status of the population. This component promotes proven hygiene practices, such as safe storage of drinking water at home, washing hands with soap at key moments (e.g., before feeding children, before cooking, after defecating), and using basic sanitation systems.

The WASHplus project in Burkina Faso, financed by USAID/Washington, and coordinated and piloted by FHI 360, attaches great importance to preventing NTDs. On one hand, it encourages its partners to increase sustainable WASH services, and secondly, it invests in behavior change activities related to promoting improved practices: simple and critical hygiene measures such as body hygiene, particularly washing the face and hands and the use soap; treating and safely storing drinking water within households; and sanitation and feces management, primarily open defecation free (ODF) initiatives.

In Burkina Faso, the project aims to reduce NTDs through an integrated approach by engaging all potential partners in curative and preventive activities. The project develops comprehensive behavior change activities that target women, while taking into account the entire community. Therefore, the project promotes healthy hygiene practices to prevent NTD re-infection among populations benefitting from curative and preventive drug treatments. This approach offers two advantages: the first is breaking the cycle of infection and disease transmission, and the second is reducing arduous efforts and excessive costs of chemoprevention activities. WASHplus,

therefore, integrates WASH activities into the ongoing fight against NTDs, and integrates NTD practices into WASH implementation programs. In practical terms, the project will incorporate WASH messages into behavior change tools and will promote their use by all actors targeted in this integration activity during key contact moments.

WASHplus will work in Gnagna Province in the district of Manni collaborating closely with potential partners, mainly existing government agencies at various levels, UNICEF, and existing WASH working groups. To this end, the project is designing a complete package of behavior change (BC) interventions that includes activities that promote WASH practices at the community level, the development and supply of various BC materials, and mass sensitization through disseminating WASH promotion messages on community radio and other existing local communication channels. The media will also cover Bogandé district where interventions will be limited to disseminating education messages on various WASH best practices via local radio channels only.

STUDY GOAL AND OBJECTIVES

The two objectives of this study are to:

- Gain a better understanding of the current situation of access to clean water, improved sanitation, and hygiene behavior that can help reduce trachoma, schistosomiasis, and soil-transmitted helminths
- Assess households' exposure levels to information promoting appropriate hygiene practices to avoid or reduce the three infections

The specific household-level indicators that this study is tracking are listed by category/domain in the following table.

Table 1 : Distribution of Key Indicators by Domain

Category/Domain	N°	Indicators: % of
Access, treatment, and use of clean water	1	Households that treat drinking water according to appropriate methods
Sanitation facilities	2	Households without latrines intending to improve their access to sanitation facilities
	3	Households with access to improved sanitation
Handwashing	4	Households with water and soap at a location commonly used by family members for washing hands
Face washing and trachoma	5	Households with a child with dirty face
	6	Caretakers reporting that child's face is washed at least daily
	7	Caretakers reporting that child's face is usually wiped with clean cloth

Category/Domain	N°	Indicators: % de
Schistosomiasis	8	Households with child who does not regularly bathe, swim, and/ or play in open water sources
Soil-transmitted helminths	9	Households where with a child who generally wears shoes when s/he goes out of the house
	10	Caretakers that do not serve child's food directly on bare floor
Transmission vectors and cleanliness	11	Household with visible human/animal feces in house or yard
Exposure to sanitation	12	Caretakers exposed to sanitation promotion efforts implemented by the project
	13	Caretakers living in a community declared ODF
	14	Caretakers believing that sanitation is good for community development
Exposure to handwashing	15	Caretakers exposed to handwashing promotion efforts
Exposure to face washing	16	Caretakers exposed to face washing promotion
Exposure to helminth prevention	17	Caretakers exposed to helminth prevention efforts
Exposure to schistosomiasis prevention	18	Caretakers exposed to schistosomiasis prevention efforts
Exposure to water treatment	19	Caretakers exposed to water treatment promotion efforts

METHODS

4.1. Study Setting

Characteristics of Survey Areas

The study was conducted in the two health districts of Manni and Bogandé in Gnagna Province, the third largest province of Burkina Faso in terms of size. Gnagna Province is a vast plain with a dense hydrographical network. All waterbodies are intermittent. There are two main rivers: the Sirba and the Faga, both tributaries of the Niger River. Some secondary water networks exist all around these tributaries.

Administratively, Manni has 155 villages in three communes: Coalla, Manni, and Thion. The district's population is estimated at 174,099 inhabitants, including 30,276 children aged one to nine years (ENVISION 2015). The district is crossed by the Faga River.

Bogandé has 274 villages in four communes: Bilanga, Bogandé, Liptougou, and Pièla. The district's population is estimated at 356,368 of which 61,972 children are aged one to nine years (ENVISION 2015). Surface water is drained by a river system belonging to the tributaries of the left bank of the Niger River. The river branches are organized into a local network that feeds into the main tributary of the Sirba or Gnagna.

The common major problem of both districts is sustainable access to drinking water, especially in rural areas, not only because an insufficient number of drinking water sources exist, but also because they are poorly distributed around the district. As a result, many rural families live long distances from the nearest borehole, sometimes 1,500 meters while the average national standard is 500 m. The living environment is marked by a precarious level of sanitation. Construction and use of latrines are underdeveloped because they are not rooted in the habits of most rural populations. Nevertheless, more and more latrines are being constructed in some villages due to the activities of projects that promote ending open defecation and assist people in building latrines.

Criteria for Inclusion

Survey units for this study are the districts (Manni and Bogandé), villages, households, and individuals.

Common inclusion criteria for the selection of Manni and Bogandé include:

1. The presence of partners from the government or NGOs that are already involved in latrine and potable water systems construction activities
2. The similarity of the high prevalence of schistosomiasis (18.83%) (ENVISION 2015)

Moreover, Manni was chosen as an HID, since it is the only overlapping commune in Gnagna Province with the USAID implementing partner, Resilience and Economic Growth in the Sahel - Resilience Enhanced (REGIS-ER), and because the prevalence of trachoma in Manni (5.16%) is

relatively higher than that of Bogandé (2.27%) (ENVISION 2015). This provides the opportunity to integrate WASH activities with MDA campaigns. Unlike Manni, Bogandé is neither a USAID resilience area nor a district eligible for MDA related to trachoma during the implementation period of WASHplus.

For each district, village's inclusion criteria was:

1. Population size larger than or equal to 1,000. The commune's development program document was used to estimate population size per village.
2. One or several improved water sources, often or borehole or pump located within two kilometers of the village.
3. No CLTS¹ activities during the last six months preceding the survey.
4. Entire village is covered by local radio station.

Households selected for this study are those with a caregiver of a child aged one to nine years.

Targeted participants for this study are primarily female caregivers of a child aged one to nine years, who are 18 years or older and have voluntarily consented to participate in the survey.

4.2. Study Type

This is a cross-sectional study with a group of high intervention districts (HID) and a group of low intervention districts (LID). The survey was conducted in October 2015.

4.3. Data Collection Methods

The survey was conducted by *Centre de Recherche de Santee n Nouna* (CRSN).

An electronic version of the questionnaire using Open Data Kit software (ODK) (Carl 2010) pre-installed in each tablet was used. The questionnaire included seven components:

1. Characteristics of targets and households
2. Sources and access to water and treatment and storage of drinking water
3. Personal hygiene and the use of soap
4. Access to sanitation facilities and management of human feces
5. Psychosocial determinants of latrine possession and hand and face washing
6. Trachoma, intestinal worms, and schistosomiasis knowledge
7. Exposure to information that promotes improved WASH and prevention of NTDs

¹ The list of villages that have not yet benefited from CLTS activities was defined in conjunction with representatives of the communes, including the presidents of special delegations, the general secretaries, the representative of the district management team, the chief nurse of the health center (centre sanitaire et prevention social—CSPS), the sanitation agents, community leaders, and hydraulic and sanitation maintenance staff. However, it is noteworthy that some villages had already initiated a process towards ODF without engaging in a formal CLTS process.

The questions were read as formulated and displayed on the tablet screen. However, some were reworded to facilitate their understanding. The questions were written in French and translated by a specialized organization (Association Tin Tua) into Moore, Fulfulde, and Gulmatchéma, which are the three most spoken local languages in the survey area. Most interviews were conducted in the local language depending on the participants' preference.

4.4. Study Population and Sampling

Targeted populations for this study were primarily female caregivers of a child aged one to nine years, who was 18 years or older and had voluntarily consented to participate in the survey. In targeted rural areas of Burkina Faso, this role is primarily held by the mother of the child. The main caregivers are responsible for dealing with issues related to WASH within the household and with the health of the child.

In rural areas of Burkina Faso, households generally reside in a compound. In the context of Burkina Faso, a compound is a housing unit formed by one or more houses that are sometimes surrounded by a fence, where one or more households live

A household is usually a socio-economic base unit in which one or more members, related or not, live in the same house or compound, pool their resources, and jointly meet their needs for food and other vital items, under the authority of one member called the head household. A household may include a man, his wife or wives if he is polygamous, and their unmarried children.

The sample was selected following a two-step approach. It consists of a selection of '**villages**' in each district, and then the "**neighborhoods**" in selected villages.

Villages that have fulfilled the different inclusion criteria were randomly selected without replacement. By district, 12 villages were selected making a total of 24 villages for the entire study.

For each selected village, all neighborhoods were considered. The number of households surveyed by district was proportional to their size in terms of population. Fifty-two neighborhoods were surveyed in Manni and 60 in Bogandé.

In each neighborhood, one household per compound, selected randomly without replacement, was interviewed. All eligible children (aged one to nine years) living in the household were identified.

In each household selected, one primary caregiver (aged 18 or more) of children aged one to nine years was interviewed. If the total number of caretakers in the selected household is equal or greater than two, the random method without replacement was also used to choose one adult to interview.

A comparative study method between a HID and LID was used. The sample size was calculated to detect a value of 50 percent on all WASHplus key indicators. This assumes an estimated sampling error of 3 percent, an error of conception equal to 2 (to minimize the frequency of getting similar responses), and a confidence interval of 95 percent. This calculation system was obtained by applying C-Survey 2.0 (Muhammad 2007). A minimum of 647 households per district was estimated. In Manni 649 households were interviewed and in Bogandé 647, for a total of 1,296 households.

4.5. Practical Implementation of the Survey

Informing Authorities and Survey Population

Before implementing field activities, an advocacy process was established. Communal and local authorities (the presidents of special delegations, prefects, and village leaders) of selected villages were formally informed of the activity as well as necessary provisions. This greatly reduced the concern of populations during the survey.

Selection of Surveyors

Surveyors for this study had at least completed high school, spoke at least one of the three locally spoken languages, and resided in the survey area. A provisional list of surveyors was established by CRSN from 35 applications following an advertisement in Gnagna Province. A shortlist of 30 candidates was subsequently made based on curricula vitae, field experiences, skills and experiences relating to household surveys, and the use of the tablets. A total of 25 surveyors were selected. Twenty were actually needed and five others served as alternates.

Regarding team leaders, four supervisors (two per district) were identified among the 30 shortlisted candidates. They possessed high school diploma level or equivalent education and demonstrated experience with similar studies.

CRSN's coordinator interviewed each candidate to ensure his/her availability for the duration of the study.

Surveyors Training and Questionnaire Pretest

The surveyor training was held in Bogandé for six days (August 25–31, 2015) under the supervision of the principal investigator and the WASHplus coordinator for Burkina Faso Edouard Tianhoun. The training schedule included sessions on the context of the investigation, ethics and informed consent, the questionnaire, use and mastery of the tablets, the household sampling procedures in villages, and data collection methodology. It also included a pretest in non-targeted communes near the study areas. The first four days of training were devoted to methodological and ethical aspects: administering informed consent, understanding the questionnaire, and individual and pair (role-play) practice for administering the questionnaire. At this step, the questionnaire was carefully explained so participants could become familiar with its contents and gain full control of using the tablets.

A pretest of all survey procedures was scheduled on the fifth day of training in Bogandé villages. All participants in this exercise were divided into five teams according to their field tasks (a team consisting of surveyor (s) and team leader or supervisor).

During the pretest, each practiced how to select households, conduct interviews, and apply methodological procedures. At the end of the pretest, the questionnaire administration time was reassessed. The sixth and final day of the training was devoted to the pretest debriefing, incorporating comments into the questionnaire, selecting the four supervisors and 20 surveyors, and making practical preparations for launching the survey.

Furthermore, a training specially dedicated to supervisors was organized on September 4, 2015. It focused on monitoring techniques, quality control methods (counter-inquiry and thorough verification of data collected daily among others), and on rough village mapping. Procedures and practical organization of field activities were also discussed.

Apart from presentations during this training, CRSN prepared other materials such as the surveyor's field manual and village's maps, which facilitated the understanding of the different topics.

Composition of Field Teams and Roles of Surveyors

The team was composed of ten surveyors and two supervisors per district.

The supervisors' role was to:

- Inform local authorities of the arrival of their team in the area
- Ensure that surveyors had all necessary and sufficient equipment (functional shelf tablet with electronic questionnaire uploaded and other accessories such as informed consent form) before deploying to the field
- Coordinate team movements
- Set the daily schedule in line with the survey plan and field difficulties
- Assign each agent's survey area (neighborhood)
- Oversee data collection, which includes monitoring how surveyors conduct interviews and find solutions to potential difficulties encountered in the field
- Ensure that surveyors stay within the survey limits
- Control electronic data collected and provide updates during the daily debriefing
- Report to the coordination team on the progress of their team and the difficulties encountered

The surveyors' duties were to:

- Locate households to be surveyed
- Conduct individual interviews with households
- Follow the instructions from the supervisor
- Participate in daily meetings
- Contact the supervisor (in case of problems)
- Implement the study methodology
- Collect data
- Check and ensure the completeness and quality of the electronic questionnaire

Identification and Location of Survey Areas

Local authorities (president of special delegation, village chief, community leaders) of selected locations were notified of survey implementation to obtain their agreement.

Supervisors received a list of villages and neighborhoods to investigate. Once the supervisor arrived at the village and after greeting local authorities, neighborhoods in each village were correctly identified under the guidance of the supervisor. After this step, neighborhoods were divided among the team members; each passed in his/her respective district to make a map and compile a list of households. The following information was collected: the compound number, name and

surname of the head of the compound, the number of households, and the presence of the targeted group. After this operation, the supervisor had an exhaustive list of the village compounds. He then proceeded to randomly select households to be surveyed.

Only after surveyors clearly identified the survey areas (neighborhoods, compound, and households) were they able to conduct interviews, according to the instructions they were given. The surveyors were distributed among the selected households in their respective neighborhoods and surveyed them one by one. Each surveyor was responsible for surveying an average of three to four households per day. This rule was generally followed.

Movement of Surveyors

Members of the same field team moved together. For each village, once the list of households was finalized, they were required to finish collecting data in households selected before moving to another village. To ensure reliability of data, everything was done to interview all selected households. In case of absence, at least two visits were carried out before considering any replacement of a targeted household.

Questionnaire Administration

This was a direct and structured interview with households. The chosen data collection method was direct individual interview with targets. That is to say, the surveyors, once in the household, approached the head of household or his representative for approval. Once the approval of the head of household was received, the respondent was given a consent form. After reading the informed consent form, and after consent was granted, the interview was conducted and the electronic questionnaire was filled.

Data Management and Quality Control

Each surveyor was given a unique identifier. Each team member received a list of villages to visit. The list and maps helped identify the precise boundaries of each neighborhood to visit. Data were collected from the electronic version of the questionnaire loaded on the tablet. At the end of each interview, the surveyor checked the completeness of information and compliance of skips. The surveyed households received a unique identifier to ensure data confidentiality. Every evening, a debriefing was done and daily completed questionnaires were sent to supervisors for control. Electronic questionnaires by village were verified and recommendations were made to supervisors, who took them into consideration.

Ethical Considerations

The protocol of this study was approved by FHI 360's and Burkina Faso's Health Research Ethics Committees. The study was conducted in compliance with fundamental ethical principles. The survey data were managed to ensure anonymity and confidentiality. Data were stored in a data base with a strictly limited password access known only to principal investigators. Moreover, all respondents' participation in this study was strictly voluntary. People were free to accept or refuse to answer the questionnaire.

During field staff training, a focus was made on the need to obtain permission from the head of household and consent from the respondent without any form of coercion. With the support of supervisors and the project team, the confidentiality of interviews was fully guaranteed. The informed consent form was read in the language of the respondent.

Data Cleaning

The data quality controls were carried out at different stages of collection. Holding debriefing sessions with supervisors at the end of each day to determine the types of common mistakes and their sources and to search for appropriate solutions was mandatory and systematic. The quality control procedure for investigators included the verification of information collected in electronic "ODK" forms at the end of each interview and the verification of their completeness before transfer to the data server. They were especially attentive to detect omissions and verify logical coherence of systematic skips integrated in the electronic questionnaires.

Verification and Handling of Data Inconsistencies

To improve the quality of information several checks were conducted during data cleaning. Controls included:

1. Validity of filters to see the completeness of the questionnaires and differentiate between nonresponse, responses without objects, and missing values
2. Search for duplicates to remove unnecessary or incomplete questions
3. Consistency tests to verify data entry errors or inconsistencies that were identified during question verification
4. Control of structure and validity of answers and codes used, which led to recoding when necessary

Data Analysis

To properly inform the purposes of the study, data management and analysis were done in several stages. Socio-demographic characteristics of primary caregivers of children aged one to nine years were analyzed. This allowed researchers to understand their profile as well as household characteristics. In addition to socio-demographic characteristics, key project indicators were estimated. These indicators were then compared by group, between HID and LID.

Variables of interest were also analyzed to understand a household's situation regarding access to potable water, sanitation facilities, children's hygiene, and caregiver's attitudes and knowledge related to NTD prevention, namely trachoma, schistosomiasis, and soil-transmitted helminths.

Socio-economic status (SES) or economic welfare index of households was calculated from answers to questions on property data. For this study, the data categories selected were the availability of electricity, solar panel, radio, television, mobile phone, oil lamp, fixed or mobile improved cook stove, bicycle, motorcycle or scooter, car or truck, human or animal drawn cart, or rickshaw. The method of principal component (Deon 2008) was used to estimate the index. Calculation details are presented in Appendix I. Households were subsequently divided into population quartiles according to their rank. Each quartile corresponds to a level of poverty ranking from the poorest (1) to the wealthiest (4).

Comparative analyses of indicators (presented in Table 1) of HID and LID were performed. For this purpose, likelihoods statistical tests were used such as Kolmogorov Smirnov for the distribution, and t-test for means.

An analysis of the determinants of some indicators associated with key behaviors such as the use of potable water and personal hygiene was carried out using linear regression. Variables used for determinants included socio-demographic characteristics (age, religion, ability to read) and respondents' access to information on NTDs as well as SES.

Limitation of the Study and Challenges

The methodological limitations of the study were:

- The inability to estimate some key indicators due to the problems of formulation or understanding of certain concepts or questions, such as rinsing hands with water only, or practical measures to reduce the presence of flies in households.
- The unavailability of some basic information for the survey (data for mapping villages, documentation to verify birthdate and exact age of child) and the misunderstanding of certain inclusion criteria, such as the CLTS concept, that have introduced some bias for the selection of villages and households with children aged one to nine.
- The lack of clarity or accuracy of some definitions such as the criteria to classify the cleanliness of children's hands during observations, making it impossible to clarify the validity of the estimated relative indicator.

RESULTS OF THE BASELINE SURVEY

5.1. The Socio-Demographic Characteristics of the Respondents

Information on socio-demographic characteristics of the respondents focused on age, marital status, religion, and education.

Structure by Age, Marital Status, and Religion

The age distribution of the respondents is similar across districts. They reveal that fewer than 24 percent of the participants were under 20 or over 40 years. These results show that the majority of the respondents (75%) were aged between 20 and 39 years. The average age was about 30 years, with a minimum of 18 years in both districts, and a maximum of 60 years in Manni and 70 years in Bogandé.

In both districts, the majority (99%) of mothers or primary caregivers of children were married.

The distribution of respondents based on their religion is identical in both districts, with a predominance of Christians (64% in Manni and 73% in Bogandé), then Muslims (25% in the two districts), and very few traditional believers or animists in Bogandé (2%) compared to Manni (10%).

Level of Education

Information was collected on respondents' enrollment or participation in literacy programs. The reading ability of those surveyed was tested during the interviews. The literacy of mothers or caregivers is an important determinant of the living conditions of households, and of their behavior or habits with regards to health and hygiene.

Overall, the education level of the sample population is very low in both districts; just over six women in ten had no formal schooling.

The proportion of main caregivers who are able to read fluently is also low in both districts: about two women out of ten could read without difficulty. Over 70 percent of women could not read at all or could read but with difficulty.

Table 2: Distribution of Respondents by Age, Marital Status, Religion, Educational Status, and Reading Ability

Structure	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Age groups in years					
18-20	86	13%	72	11%	0.52
20-25	138	21%	151	23%	
26-30	157	24%	159	25%	
31-35	123	19%	111	17%	
36-40	74	11%	86	13%	
41+	71	11%	68	11%	
Mean (SD)	30 (8)		30 (8)		(T-Test) 0.79
Median	29		30		
Minimum	18		18		
Maximum	60		70		
Marital status					
Married	645	99%	638	99%	0.81
Without partner	4	1%	9	1%	
Religion					
Christian	416	64%	473	73%	0.24
Muslim	168	26%	162	25%	
Traditional	65	10%	12	2%	
Education status or literacy					
Literate	90	14%	177	27%	0.09
Educated	46	7%	71	11%	
Has no learning experience	513	79%	398	62%	
Reading capability (Among those who are literate or educated)					
	136		248		0.16
Cannot read	59	43%	141	57%	
Reads with difficulty	40	29%	34	14%	
Reads fluently	33	24%	44	18%	
Was not involved	2	1%	2	1%	
No response	2	1%	27	11%	

5.2. The Socio-Economic Characteristics of Households

The socio-economic status of households was estimated from: 1) the possession of some valuable property like a house, home appliances, and means of communication or of access to information and means of transportation and 2) housing characteristics.

The type of floor covering, such as clay, and the sharing of a compound with other households may facilitate the transmission of some disease vectors.

Status of Households' Land Tenure

The vast majority (99%) of households in Manni and Bogandé own their own house. However, most houses are located in a shared compound with other households, 83 percent in Manni and 89 percent in Bogandé.

The type of flooring used in homes varies by district. In Manni, 86 percent of dwellings have a clay floor vs. 70 percent in Bogandé ($p < 0.05$). Only 14 percent of Manni households have a concrete floor while in Bogandé 30 percent do ($p < 0.05$).

Economic Status of Households

In general, household characteristics were similar in the two districts, however, some disparities exist based on the possession of improved stoves and horses.

The most common property owned by households related to:

- Means of communication and access to information: mobile phone (87%), radio (68%)
- Vehicles and means of transportation: bicycle (77% in Manni and 84% in Bogandé), motorcycle or scooter (49% in Manni and 46% in Bogandé)
- Livestock: poultry and sheep/goats/pigs (at least 82% of households), cattle (55%), horses (45% in Manni and 67% ($p < 0.05$) in Bogandé)
- Domestic energy: solar panels (33% Manni and 39% in Bogandé)
- Means of cooking foodstuffs: mobile improved stoves (11% in Manni and 5% ($p < 0.05$) in Bogandé), improved fixed stoves (12% in Manni and 6% ($p < 0.05$) in Bogandé)

Moreover, in the two districts, fewer than 5 percent of households own a TV set, a car or truck, or have access to electricity. No household uses a landline telephone.

The SES is evenly distributed by population quartile. A quarter of the population come from each quartile in both of the two districts.

Table 3: Distribution of Households by Land Tenure Status and Type of Housing, Type of Building Materials, and Property Ownership

Type of housing and property ownership	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Tenure of Housing					
Owner	644	99%	638	99%	0.98
Tenant	3	0%	4	1%	
Occupant (nonpaying)	2	0%	5	1%	
Type of housing					
Shared compound	541	83%	576	89%	0.61
Private	107	16%	64	10%	
Other (unspecified)	1	0%	5	1%	
Type of floor coating					
Clay	561	86%	455	70%	0.03
Concrete	88	14%	192	30%	
Ownership of certain goods:					
Source of energy					
Electricity (Yes)	10	2%	32	5%	0.88
Solar panel (Yes)	211	33%	251	39%	0.72
Oil lamp (Yes)	86	13%	27	4%	0.04
Source of information					
Radio (Yes)	449	69%	438	68%	0.93
Television (Yes)	13	2%	33	5%	0.65
Means of communication					
Mobile telephone (Yes)	565	87%	565	87%	0.97
Landline (Yes)	0	0%	1	0%	---
Improved stoves					
Mobile improved stove (Yes)	72	11%	31	5%	0.03
Fixed improved stove (Yes)	78	12%	38	6%	0.04
Means of transportation					
Motorcycle, scooter (Yes)	321	49%	295	46%	0.76
Bicycle (Yes)	497	77%	546	84%	0.52
Simple cart (Yes)	350	54%	307	47%	0.47
Cart with animal traction (Yes)	234	36%	281	43%	0.31
Car, truck (Yes)	6	1%	9	1%	---

Livestock

Donkey (Yes)	56	9%	115	18%	0.04
Rickshaw (Yes)	16	2%	38	6%	0.33
Cattle (Yes)	360	55%	361	56%	0.97
Poultry (Yes)	541	83%	569	88%	0.93
Horses (Yes)	294	45%	435	67%	0.04
Sheep/goat/Pigs (Yes)	530	82%	546	84%	0.82

SSE

Poorer	153	24%	144	22%	0.73
Poor	170	26%	179	28%	
Affluent	157	24%	161	25%	
More affluent	169	26%	163	25%	

Socio-Professional Status of Respondents

The professional occupations of men often favor the development and transmission of NTDs. Their natural variations can also indicate the seasonal nature of the occurrence of NTDs, since they determine the variation and frequency of human contact with vectors of diseases. These could be contacts with contaminated water during seasonal activities in agriculture or gold panning, or with flies in livestock breeding activities, as the presence of animal droppings could increase the gathering and abundance of flies especially in arid areas such as Burkina Faso (De Sole 1987).

The distribution of respondents by major occupations varies across districts. During the 12 months preceding the survey, 45 percent of respondents exercised an income-generating activity in Manni compared to 77 percent in Bogandé ($p < 0.05$).

Most of the women interviewed were merchants (56% in Manni and 38% ($p < 0.05$) in Bogandé) and farmers (17% in Manni and 25% ($p < 0.05$) in Bogandé). Very few were engaged in gold panning activities in Manni (2%) compared to Bogandé (25%, $p < 0.05$). Conversely, 16 percent of women care for livestock in Manni while only 4 percent do so in Bogandé ($p < 0.05$).

Researchers noted a decline in income-generating activities during the month of October, the period of the survey. During the investigation, 38 percent of respondents in Manni and 18 percent ($p < 0.05$) in Bogandé had jobs that allowed them to earn money.

In Manni, a reduction in trade activities was recorded during the month of the survey: only 15 percent of women were vendors. But there was an increase in the number of farmers (81%). These results suggest that during the month of October women in Manni, a rural area, are engaged in farming, especially in growing vegetables according to the farming calendar in the eastern region of Burkina Faso.

In Bogandé, a semi-urban area, of the women who reported an income-generating activity during the month of the survey, 10 percent of them prefer temporary paid chores in other households (probably because of children's return to school in October) to artisanal gold mining activities. This may explain

the decrease in the proportion of respondents involved in artisanal gold mining during the past 12 months from 22 percent to 10 percent.

Socio-Professional Status of the Respondents' Husbands

The same trends are observed related to the socio-professional status of the husbands of the respondents, that is to say, disparities exist across districts and variations by month: 56 percent of husbands had paid work during the last 12 months in Manni, compared to 64 percent in Bogandé ($p < 0.05$). The decrease in the proportion of husbands who had income-generating activities during the month of October is common to the two districts: 47 percent in Manni and 34 percent in Bogandé ($p < 0.05$).

In Manni, the number of gold miners during the last 12 months, has almost halved during the month of the survey, while the number of merchants nearly tripled in the same month ($p < 0.05$). The gold miners are turning to other activities during the rainy season (October included), a season that is not favorable for traditional gold mining. Many traditional gold mining sites remain closed during the rainy season to prevent hazards such as landslides.

In Bogandé, variations in the number of farmers and stockbreeders is more obvious: 25 percent of husbands were farmers during the last 12 months, and only 7 percent ($p < 0.05$) were occupied as farmers during the month of the survey, while the number of stockbreeders doubled during the same month to 16 percent from 8 percent ($p < 0.05$) over the last 12 months. The rainy season is more favorable to stockbreeding given the availability of pasture. For some, it is also the period to engage in livestock fattening for sale during the end of year festivities.

Others: Growing Cash Crops and Household Members' Contributions to the Family Income

In Burkina Faso, cash crop farmers mainly specialize in producing cotton. In Manni, 56 percent of households grow cash crops compared to 64 percent in Bogandé. Regarding the income of household members, men (husbands) have the highest income in at least 89 percent of cases; only 3 percent of women (wives) and 1 percent of any other household member earn the highest income.

Table 4: Distribution of Households by Economic Status and Main Occupation of the Respondent

Primary occupation of the respondent	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Respondents employed in income-generating activity during the last 12 months					
Yes	299	46%	388	60%	0.02
No	349	54%	258	40%	
No response	1	0%	1	0%	
Primary occupation of the respondent during the last 12 months (Among those who had an income-generating activity during the last 12 months)					
	299		388		0.03
Merchant (<i>informal sector</i>)	167	56%	146	38%	
Farmer	51	17%	98	25%	
Gold miner	5	2%	84	22%	
Stockbreeder (poultry/cattle)	49	16%	16	4%	
Other	27	9%	44	11%	
Respondents employed in income-generating activity during the month					
	649		647		0.03
Yes	247	38%	114	18%	
No	402	62%	533	82%	
Primary occupation of the respondent during the month (Among those who had an income-generating activity during the month)					
	247		114		0.01
Merchant (<i>informal sector</i>)	36	15%	42	37%	
Farmer	200	81%	25	22%	
Gold miner	1	0%	15	12%	
Stockbreeder (poultry/cattle)	7	3%	11	10%	
Domestic worker	1	0%	11	10%	
Other	2	1%	10	9%	

Table 5: Distribution of Households by Primary Occupation of the Husband, Growing of Cash Crops, and Contribution of Household Members to the Family Income

Primary occupation of the husband	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Husband employed in income-generating activity during the last 12 months					
	649		647		
Yes	364	56%	412	64%	0.04
No	281	43%	235	36%	
No response	4	1%	0	0%	
Primary occupation of the husband during the last 12 months (Among those who had an income-generating activity during the last 12 months)					
	364		412		
Merchant (<i>informal sector</i>)	95	26%	87	21%	0.14
Stockbreeder (poultry/cattle)	91	25%	32	8%	
Gold miner	79	22%	93	23%	
Farmer	38	10%	103	25%	
Employee (<i>informal sector</i>)	16	4%	40	10%	
Employee (<i>formal sector</i>)	22	6%	30	7%	
Other	23	6%	27	7%	
Primary occupation of the husband during the month					
	649		647		
Yes	307	47%	220	34%	0.03
No	342	52%	427	66%	
Primary occupation of the husband during the month of the survey (Among those who had an income-generating activity during the month)					
	307		220		
Merchant (<i>informal sector</i>)	184	60%	64	29%	0.01
Stockbreeder (poultry/cattle)	51	17%	36	16%	
Gold miner	34	11%	53	24%	
Farmer	12	4%	16	7%	
Employee (<i>informal sector</i>)	13	4%	34	15%	
Employee (<i>formal sector</i>)	13	4%	17	8%	
	649		647		
Households having grown a cash crop					
Yes	289	45%	496	77%	0.01
No	360	55%	151	23%	
Family member who earns the most money					
	649		647		
Chief of the household (<i>Husband</i>)	616	95%	575	89%	0.49
Respondent	18	3%	63	10%	

Other members | 15 | 2% | 9 | 1% |

5.3. Access to Water

The availability and access to safe drinking water influences hygiene practices within households. The distance of the water source from the place of residence constitutes a risk and/or aggravating factor for certain NTDs (Taylor 1989).

In both districts, the water used by households comes mostly from an improved source (75% in Manni and 82% in Bogandé). The main water source cited by households that use an improved source is the pump or borehole (73% in Manni and 77% in Bogandé); a small proportion (less than 3 percent) mentioned the protected well or tap water (see Figure 1). This confirms the fact that the majority of the population uses the water supply infrastructure made available to them in their respective villages.

Besides, among the households that only have access to unimproved water sources, (25% in Manni and 18% in Bogandé), the distribution by water source differs from one district to the other. Surface water is by far the most used water source (60% in Manni and 93% ($p < 0.05$) in Bogandé), followed by unprotected wells (27% in Manni and only 3% ($p < 0.05$) in Bogandé), and finally rain water (12% in Manni and 4% ($p < 0.05$) in Bogandé). Almost half of the water sources, whether improved or not, are close to the dwelling places, that is to say, within 30 minutes' walk from the houses in both districts.

Treatment of Domestic Drinking Water

Generally speaking, the treatment of drinking water is not yet a common habit for most households; the practice varies across districts (99% of households do not treat their drinking water in Manni compared to 87% ($p < 0.05$) in Bogandé). Worse still, among those that get water from unimproved sources, only 4 percent treat their drinking water in Manni compared to 24 percent ($p < 0.05$) in Bogandé.

Improved water source

(Those who mentioned improved water source)

Unimproved water source

(Those who mentioned unimproved water source. ^a = $p < 0.05$)

Pump or well

*Protected
spring*

Tap water

*Surface
water*

*Unprotected
spring*

Rain water

Table 6: Distribution of Households by Source, Treatment, and Water Conservation

Source and treatment of drinking water	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Source of drinking water					
Improved*	486	75%	527	81%	0.48
Unimproved**	163	25%	120	19%	
Source of drinking water is the same as that for other uses					
Yes	549	85%	522	81%	0.72
No	97	15%	125	19%	
Source of drinking water is improved and close to house					
Improved and close	300	46%	268	41%	0.14
Improved and far	186	29%	260	40%	
Unimproved and close	111	17%	60	9%	
Unimproved and far	52	8%	59	9%	
Source of drinking water is treated					
Yes	9	1%	82	13%	0.69
No	640	99%	565	87%	
Water treatment according to the source (enhanced or not)					
<i>For water fetched from an unimproved source that</i>					
	163		119		0.04
Was not treated	157	96%	91	76%	
Was treated	6	4%	28	24%	
<i>For water fetched from an improved source that</i>					
	486		528		0.56
Was not treated	483	99%	474	90%	
Was treated	3	1%	54	10%	
Water treatment technique					
	649		647		
None	640	99%	565	87%	
Chlorine (<i>effective</i>)	1	0%	13	2%	
Filtered (<i>effective</i>)	6	1%	20	3%	
Boiled (<i>effective</i>)	0	0%	1	0%	
Other (decantation, use clean containers)	2	0%	48	7%	

* Improved: pump or borehole, protected well, tap water

** Unimproved: surface water, unprotected well

Reasons for not Treating Drinking Water

The main reasons for not treating drinking water at home are, in descending order of importance, the quality of the water, which four respondents out of ten believe is already safe and therefore no longer requires any treatment; ignorance that the drinking water must be treated; the lack of materials or treatment products; not in the habit of treating drinking water at home; and finally the fact that no one ever got ill from it.

The method for storing drinking water is, generally speaking, correct in both districts (over 95% of households store their drinking water in containers with a narrow spout to avoid or minimize contamination). Furthermore, almost nine of ten households clog the spout or cover the container to ensure proper storage of drinking water at home. However, a small proportion (3% or less) does not protect it at all.

Table 7: Distribution of Households by Reasons for not Treating Drinking Water and by Water Conservation Means

Reasons for not treating drinking water	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Reasons for not treating drinking water					
<i>(Asked to all those who have or have not treated their water)</i>					
	649		647		
Water source already safe, no need for treatment	276	43%	254	39%	0.65
Does not know that drinking water must be treated	171	26%	202	31%	
No materials or products for treatment	160	25%	36	6%	
Common practice not to treat water	9	1%	51	8%	
No one ever got sick from it	19	3%	6	1%	
No response	14	2%	98	15%	
Means of storing drinking water					
Container for storing water has a narrow spout					
Yes (Can, jar, clay pot (<i>canary</i>))	631	97%	620	96%	0.92
No (Barrel, bucket)	18	3%	27	4%	
Container for storing water is adequate (with narrow spout and covered)					
A narrow spout covered	564	87%	578	89%	0.83
A narrow spout not covered	67	10%	42	6%	
Has no narrow spout but covered	6	1%	21	3%	
Has no narrow spout and not	12	2%	6	1%	

covered

Determinants of Access to an Improved Water Source Nearby

In Manni, improved water sources are closest to wealthier households, to women who can read fluently, and to those who were exposed to information campaigns about water treatment. In Manni, the top two quartiles, affluent and more affluent households, are respectively 1.82 and 3.09 times more likely to have access to an improved water source that is close to their homes than the poorest households. The respondents who read fluently are 3.63 times more likely than illiterate respondents to have access to an improved source in Manni; those who were exposed to information about treating drinking water are 2.33 times more likely to have access to an improved source than those who were not exposed. However, religion does not determine distance to an improved water source in Manni.

In Bogandé, Christians (Catholic or Protestant) who can read fluently have closer access to an improved water source. For example, Christians are 3.79 times more likely to use it than traditional believers and the literate are 5.06 times more likely to have an improved water source nearby than illiterate households. Unlike in Manni, the SES and exposure to information about the treatment of drinking water are not associated with proximity to an improved water source in Bogandé where a good spatial distribution of water infrastructure provides access to water nearby to the entire population.

Table 8: Determinants of Access to an Improved Water Source Nearby

Access to an improved water source nearby and its determinants	Modalities	Manni				Bogandé			
		p	Exp(β)	95% IC (Exp β)		p	Exp(β)	95% IC (Exp β)	
				Lower	Upper			Lower	Upper
Have access to an improved water source and near the dwelling place									
SES	Poorer	Reference				Reference			
	Poor	.08	1.54	.95	2.49	.06	1.74	.99	3.05
	Affluent	.02	1.82	1.12	2.96	.29	1.35	.78	2.35
	More affluent	.00	3.09	1.81	5.26	.16	1.49	.85	2.61
Religion	Traditional	Reference				Reference			
	Christian	.21	1.44	.81	2.56	.03	3.79	1.17	12.26
	Muslim	.54	1.21	.65	2.28	.19	2.25	.68	7.50
Literate	No	Reference				Reference			
	Yes	.03	3.63	1.10	12.05	.03	5.06	1.21	21.18
Exposure to information about treating drinking water	No	Reference				Reference			
	Yes	0.0	2.33	1.51	3.6	.57	.88	.57	1.36

Bold numbers are statistically significant with p < 0.05

Exp (β) is the chance or the probability ratio between the different modalities and that of the reference. For example, the coefficient SES Exp (β) = 3.09 for the wealthier in Manni, means that wealthier households are 3.09 times more likely to have access to an improved water source nearby than the poorer Manni households.

5.4. Sanitation Facilities

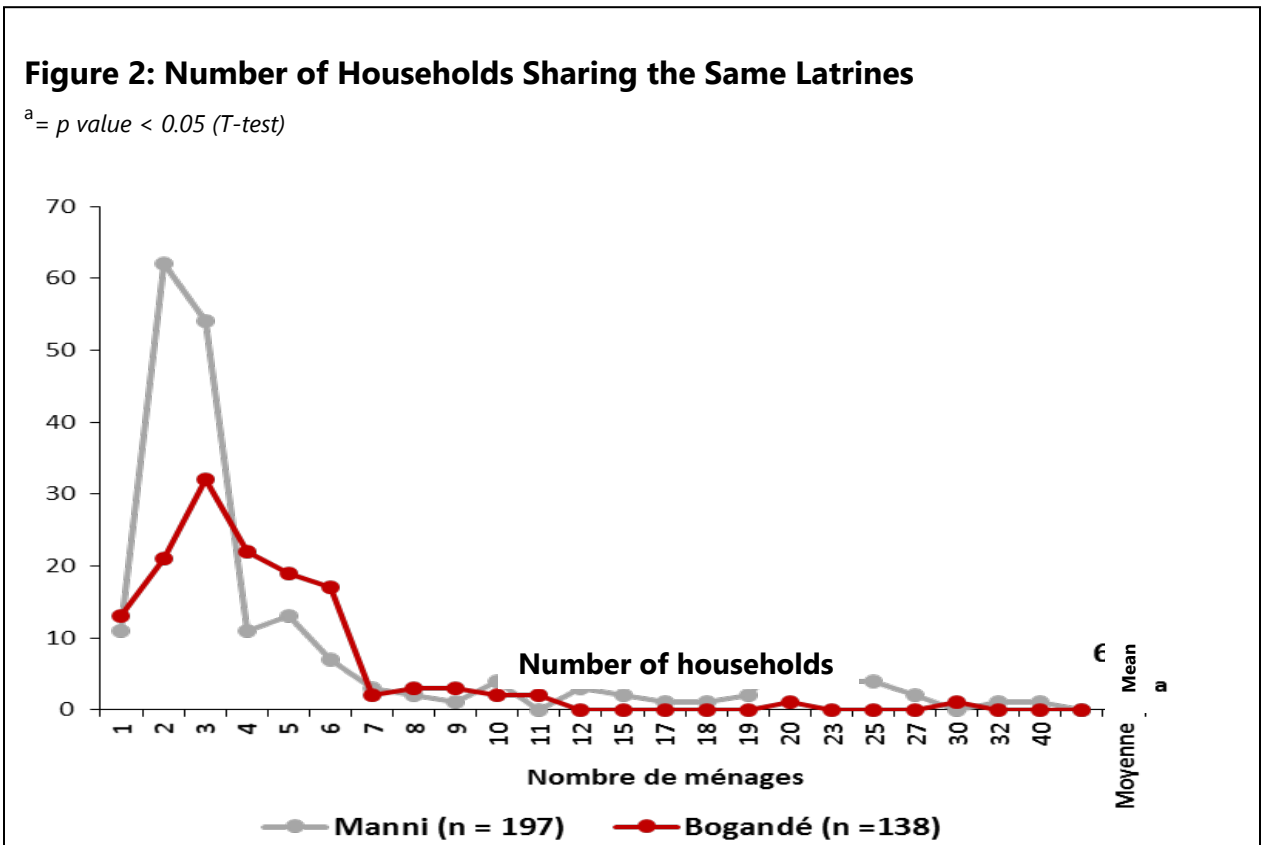
Better management of human excreta through access to or use of adequate latrines is one of the foremost conditions for preventing or reducing the spread of pathogens in a household's environment. Such reduction would be more effective when the latrines are for private use, and especially when the feces from infants or young children are deposited into the latrines.

Access to Latrines

The distribution of access to latrines shows some disparities between districts: 53 percent of households have access to latrines in Manni and 35 percent ($p < 0.05$) in Bogandé. This means that 47 percent of households still practice defecation in the open or in "bushes" in Manni compared to 65 percent ($p < 0.05$) in Bogandé. Likewise, for the distribution of access to improved latrines, 51 percent of households use improved latrines in Manni compared to 31 percent ($p < 0.05$) in Bogandé.

Of those who have access to toilets, 96 percent in Manni and 92 percent in Bogandé use an improved latrine with walls and a roof. These are mostly pit latrines with slabs and ventilated improved pit latrines; very few flush toilets exist.

Moreover, in the two districts, about six of ten households share their latrines with other households. The average number of households sharing the same latrine varies by district. In Manni, on average, six households share the same latrine, while in Bogandé, the average number is four ($p < 0.05$), with a maximum of 40 households in Manni and 30 in Bogandé.



Cleanliness and Quality of the Latrines' Pit

The latrine condition, in terms of cleanliness and the presence of functional accessories (slab and cover), vary by district. For example, 54 percent of the latrines observed during the investigation are clean in Manni compared to 68 percent in Bogandé. That is, the floor or the slab has a clean appearance but no anal cleaning materials were found, and 52 percent of latrines in Manni and 69 percent ($p < 0.05$) in Bogandé are equipped with a tight-fitting cover or slab over the hole of the pit.

For 85 percent of the latrines observed in Manni and 79 percent of those in Bogandé, the hole of the pit has a diameter that is small enough for young children to feel safe when using them.

Table 9: Distribution of Households Based on Access, Type, and Condition of the Latrines

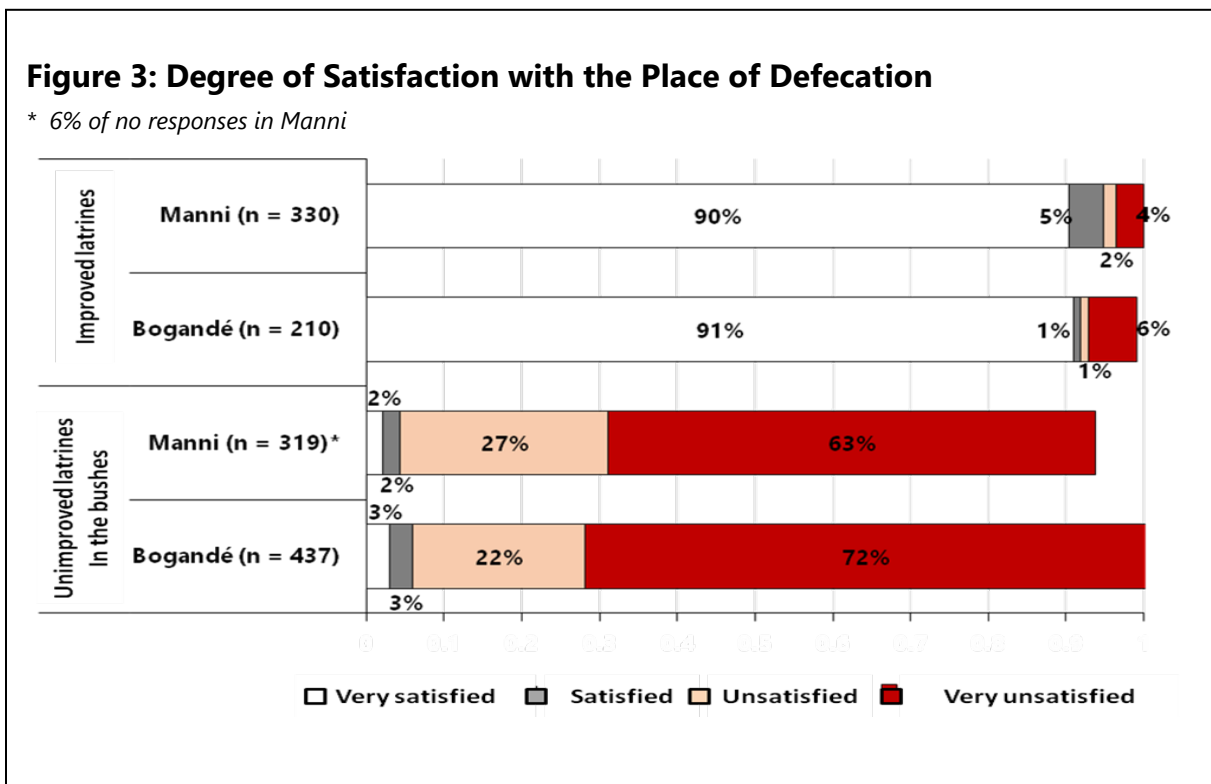
Access and condition of latrines	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Access to latrines					
Yes	342	53%	228	35%	0.03
No	307	47%	419	65%	
Quality of the latrine used					
Improved*	330	51%	210	32%	0.03
Not improved** and in the open	317	49%	437	68%	
<i>(Among households with latrines)</i>					
Effective use of the latrine					
	342		228		
Yes	332	97%	221	97%	0.96
No	10	3%	7	3%	
Quality of the latrine used					
Improved *	330	96%	210	92%	0.90
Not improved**	12	4%	18	8%	
Use of latrine privately without sharing with other households					
Yes	197	58%	138	61%	0.87
No	145	42%	90	39%	
Floor condition/slab of the latrine (observation)					
Very clean	185	54%	155	68%	0.04
Relatively clean	98	29%	45	20%	
Dirty and uncleaned	48	14%	19	8%	
No response	11	3%	9	4%	
Condition of cover/slab of the pit hole (observation)					
Present and well adjusted	178	52%	158	69%	0.03
Present but faulty	111	32%	36	16%	
No cover/slab	39	11%	26	11%	
No response	14	4%	8	4%	
Presence and quantity of anal cleaning materials (observation)					
No cleaning materials	189	55%	156	68%	0.23
Some cleaning materials	101	30%	45	20%	
A lot of cleaning materials	40	12%	16	7%	
No response	12	4%	11	5%	
Hole small enough for a child to feel safe					
Yes	290	85%	179	79%	0.15
No	42	12%	42	18%	
No response	10	3%	7	3%	

* Improved: latrines' pits have slab, with/out flush water, with walls, and roof that ensure privacy
 ** Not improved: latrines' pits without slabs and with no roof

Level of Satisfaction with the Current Place of Defecation

One objective of the survey was to measure the degree of satisfaction of respondents with where household members defecate. Their opinion was evaluated on a value scale from 1 (very dissatisfied) to 4 (very satisfied).

In both districts, among households with access to improved latrines, about nine respondents out of ten are very satisfied with the place where they defecate. A small percentage of them, 4 percent in Manni and 6 percent in Bogandé, said they are very unsatisfied. In the two districts, among households who defecate in the open or in the bushes, or those using unimproved latrines, 63 percent of respondents in Manni and 72 percent in Bogandé are not at all satisfied with the place where they defecate, and about one respondent in four says she is unsatisfied.



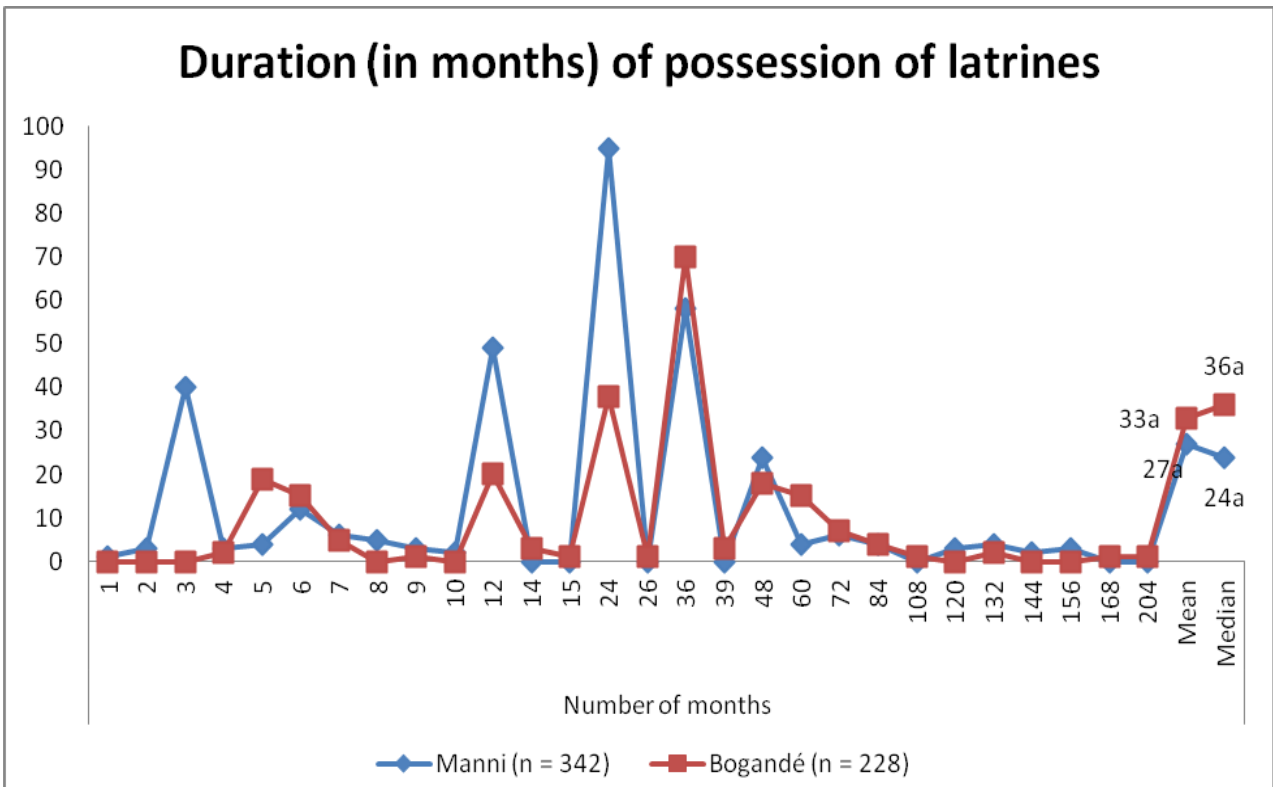
Plans to Improve (in the Next Six Months) the Current Place of Defecation

Table 10 summarizes the actions planned by households for improving their current sanitation situation. Of those who are not currently users of latrines, 75 percent in Manni and 77 percent in Bogandé are planning to build a private latrine within the next six months. Curiously, among those who already have access to improved latrines, approximately 75 percent in Manni and 68 percent in Bogandé want to change their latrine in the next six months. Furthermore, in Figure 4, the median duration of possession of latrines, which varies by district, is 24 months in Manni and 36 months ($p < 0.05$) in Bogandé.

The person who makes the decision about building the latrines varies by district. For example, the responsibility of making decisions to build the latrines falls on the husband mainly in Manni (83%) compared to Bogandé (57%, $p < 0.05$), while only 6 percent of the chiefs of compounds actually make such decisions in Manni and 21 percent ($p < 0.05$) in Bogandé.

Figure 4: Duration (in Months) of Ownership of Latrines

^a: p value < 0.05 (T-test)



Managing Children's Stools

Young children may carry many worms in their stomach. Their stools are therefore as harmful as those of adults. They actually contain many parasites and often eggs from worms. It is recommended that their stools be disposed of in latrines.

This habit, which varies by district, has not yet been adopted by 61 percent of caregivers in Manni and 77 percent ($p < 0.05$) of those in Bogandé. Almost half of the children defecate in the compound or in the house. Only 42 percent of respondents in Manni and 34 percent in Bogandé said their children aged one to nine years defecate in a pot. A very small proportion of children (less than 3 percent in Manni and none in Bogandé) defecate inside their own pants. These results may be under/overestimated, since the exact age of children is missing.

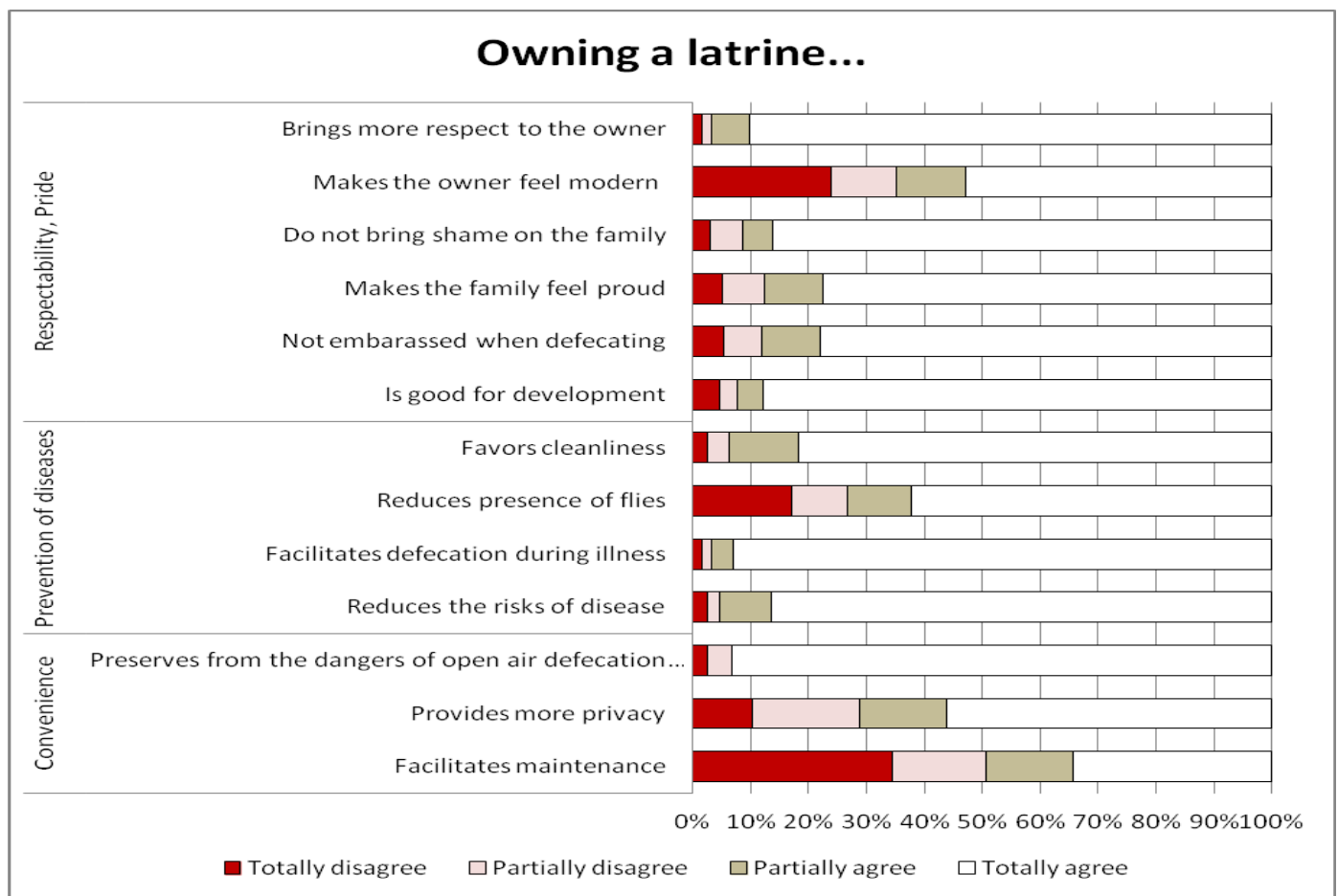
Table 10: Distribution of Households by Plans to Build or Change Latrines and by Places Where Children's Stools are Dumped

Plans to build latrines and manage children's stools	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Plans to build a latrine in the next 6 months					
<i>(Currently not user of a latrine)</i>					
	307		419		
Yes	230	75%	322	77%	0.89
No	57	19%	60	14%	
Does not know	20	7%	37	9%	
Plans to change latrines in the next 6 months					
<i>(Currently a user of a latrine)</i>					
	342		228		
Yes	252	74%	154	68%	0.63
No	90	26%	74	32%	
	649		647		
Who decides to build the latrines					
Husband	283	83%	131	57%	0.03
Chief of the compound	19	6%	49	21%	
Father/brother/son-in-law	9	3%	23	10%	
Respondent herself	17	5%	2	1%	
Other <i>(any other person living in the compound)</i>	4	1%	4	2%	
No response + Does not know	10	3%	19	8%	
Respondents report having ever disposed of the child's stools in the latrine					
Yes	255	39%	146	23%	0.04
No	394	61%	501	77%	

Psychosocial Determinants of Latrine Ownership

In Burkina Faso, owning a latrine may carry information about the owner's social status (respectability and pride for the owner). For instance, 90 percent of the respondents think that owning a latrine gives the owner more respect; 78 percent think that it makes the family feel proud. Owning a latrine can also contribute to preventing disease (86%) as it helps ensure cleanliness (82%) or reduce the presence of flies (62%), or can make defecation during illnesses more convenient (93%). Finally, latrines are more convenient to use because they help avoid the dangers associated with defecating in the bushes at night, guarantee privacy (56%), and facilitate cleaning (34%).

Figure 5: Psychosocial Determinants of Latrines' Ownership



Determinants of Access to Improved Latrines

In Manni, improved latrines are accessible to affluent households, Christians, respondents aged 21-25, or 36-40, and to those exposed to information campaigns on sanitation, particularly to information on the use of improved latrines. For example, the wealthiest households were 4.53

times more likely to use improved latrines than poorer ones; Christians were 4.49 times more likely to have access to latrines than traditional believers; women aged 36-40 were 2.09 times more likely to use them than those older than 40, and finally those who had heard messages promoting the use of latrines were 2.39 times more likely to use them than those who were not exposed to this information. But in Manni, reading ability does not affect access to improved latrines.

However in Bogandé, Christians (Catholic or Protestant) or those who can read fluently have more access to improved latrines. Christians were 6.82 times more likely to use them than traditional believers, and the literate were 2.69 times more likely than the illiterate. Unlike in Manni, the SES, the age, and exposure to sanitation-related information are not associated with access to improved latrines in Bogandé.

Table 11: Determinants of Access to Improved Latrines

Access to improved latrines and its determinants	Modalities	Manni				Bogandé			
		p	Exp(β)	95% IC (Exp β)		p	Exp(β)	95% IC (Exp β)	
				Lower	Upper			Lower	Upper
Have access to an improved latrine									
SES	Poorer								
	Poor	.00	2.05	1.29	3.24	.98	.99	.61	1.61
	Affluent	.00	3.26	2.04	5.22	.14	1.44	.89	2.33
	More affluent	.00	4.53	2.83	7.25	.33	1.27	.78	2.06
Religion	Traditional								
	Christian	.00	2.61	1.51	4.49	.07	6.82	.87	53.26
	Muslim	.76	1.10	.60	1.99	.43	2.30	.29	18.53
Literate	No								
	Yes	.05	2.09	1.00	4.36	.00	2.69	1.45	4.99
Age	40+ years								
	36-40	.02	2.09	1.10	3.96	.06	.49	.23	1.04
	31-35	.10	1.70	.91	3.20	.36	1.35	.71	2.59
	26-30	.10	1.61	.92	2.81	.56	.83	.44	1.56
	21-25	.03	1.83	1.07	3.13	.91	.97	.54	1.74
	18-20	.16	1.49	.86	2.57	.59	.85	.47	1.54
Exposure to information on sanitation	No								
	Yes	.01	2.39	1.73	3.32	.96	1.08	.71	1.43

Determinants of Access to Private Latrines

In both districts, individual latrines are accessible only to relatively affluent households. Thus, the wealthiest were 2.56 times more likely to use private latrines in Manni and 5.29 times more likely in

Bogandé than the poorest. Moreover, in Bogandé, women who have heard campaign messages on the use of latrines were 2.44 times more likely to have their own latrines than those who have not, but this is not the case in Manni.

Table 12: Determinants of Access to Private Latrines

Access to improved latrines and its determinants	Modalities	Manni				Bogandé			
		p	Exp(β)	95% IC (Exp β)		p	Exp(β)	95% IC (Exp β)	
				Lower	Upper			Lower	Upper
Have access to an improved latrine									
SES	Poorer	Reference				Reference			
	Poor	.60	1.22	.58	2.56	.23	1.75	.71	4.33
	Affluent	.68	1.17	.56	2.43	.28	1.62	.67	3.92
	More affluent	.01	2.56	1.27	5.17	.00	5.29	2.24	12.44
Exposure to information on sanitation	No	Reference				Reference			
	Yes	.50	1.18	.73	1.92	.01	2.44	1.33	4.50

5.5. Availability and Use of Soap

The use of soap plays an essential role in hygiene in general, and in personal care in particular. It helps to safely and thoroughly eliminate pathogens and other contaminants.

In both districts, the availability of soap could be observed in eight of ten households. However, the person in charge of purchasing soap differs from one district to the other. In many instances, the respondents purchase soap, 60 percent in Manni compared to 45 percent ($p < 0.05$) in Bogandé, or it is purchased by their husbands, 38 percent in Manni and 47 percent ($p < 0.05$) in Bogandé.

In both districts, soap is mainly used for laundry (96% to 100%), to wash the body (93% to 97%), to wash the body of children (57% to 64%), and to wash children's hands (26% to 11%). About one-quarter of respondents reported using soap for both housekeeping and personal hygiene.

Furthermore, no respondent mentioned spontaneously using soap to wash her own hands in the two districts. However, citing the five key moments for handwashing with soap to avoid the risks of contracting infectious diseases, interviewers asked respondents to indicate how often they practiced handwashing with soap during each of the aforementioned moments; the distribution of handwashing with soap is similar for both districts. For example, in both districts, about six in ten women reported having always washed their hands with soap after defecation or after washing the buttocks of children, about five of ten women do the same before eating, and approximately four in ten women say they wash their hands with soap before cooking. In Manni, 57 percent of respondents say they always wash their hands with soap at various key moments compared to 51

percent in Bogandé while 38 percent of respondents in Manni never wash their hands with soap compared to 41 percent in Bogandé.

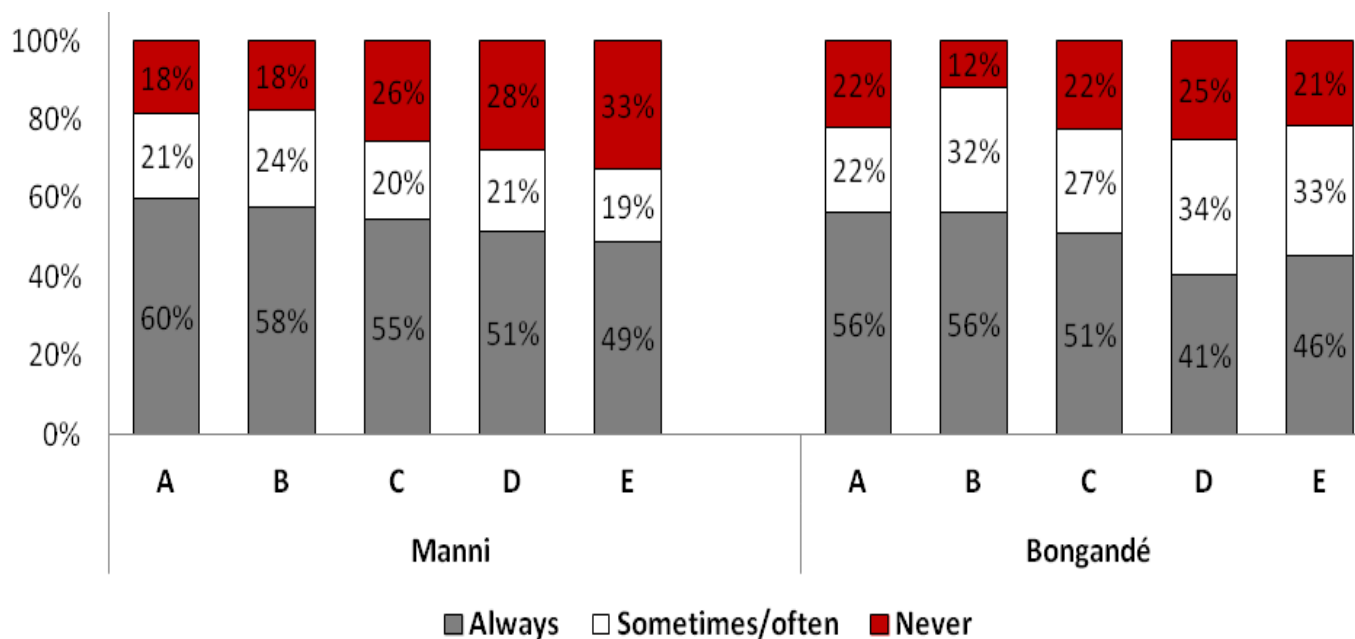
Table 13: Households Distribution by Possession and Use of Soap

Availability and use of soap	Manni		Bogandé		Kolmogorov Test p(value)
	N = 649		N = 647		
	n	%	n	%	
Has soap in the household					
Yes	499	77%	514	79%	0.90
No	150	23%	133	21%	
<i>(Within the group of those who have soap)</i>					
	499		514		
Family member in charge of the purchase of soap					
Myself	298	60%	233	45%	0.02
Husband	190	38%	241	47%	
Other family member	11	2%	40	8%	
Reasons for use of soap in the family					
Laundry	478	96%	514	100%	0.94
Washing the body	465	93%	499	97%	0.95
Washing children's body	284	57%	327	64%	0.51
Washing children's hands	132	26%	58	11%	0.03
Washing the face	42	8%	32	6%	0.49
Washing children's face	38	8%	29	6%	0.49
Washing children's feet	32	6%	13	3%	0.16
Others (<i>washing foodstuffs</i>)	1	0%	16	3%	—
Handwashing	0	0%	0	0%	—
	N = 499		N = 514		
The soap is used by family members for multiple purposes*					
Yes	117	23%	126	25%	0.84
No	382	77%	387	75%	
	649		647		
Respondents who wash their hands with soap at the various key moments **					
Always	368	57%	330	51%	0.47
Sometimes or often	33	5%	53	8%	
Never	248	38%	264	41%	

* Multiple purposes include: body hygiene and domestic uses such as laundry, washing dishes or other.

** The key moments are, after leaving the latrine, after washing the buttocks of children, before eating, before feeding children, before cooking.

Figure 6: Distribution of Handwashing with Soap during the Five Key Moments



A = After leaving the latrines B = After washing the buttocks of a child

Determinants of the Availability of Soap Within the Household

In both districts, it is more likely to find some soap in wealthier households, Christian and Muslim respondents. For example, wealthier families are 3.05 times more likely to have some soap within the household than the poorest families in Manni and 3.36 times more likely in Bogandé. Muslim respondents are at least 4 times more likely to have access to soap than those with traditional religious beliefs in both districts. However, the literacy does not determine the availability of soap at home in both districts.

In Manni, age does not determine the possession of some soap, while in Bogandé, women aged 26-40 are twice as likely to have some soap at home as those over age 40.

Table 14: Determinants of the Availability of Soap within the Household

Availability of soap and its determinants	Modalities	Manni				Bogandé			
		p	Exp(β)	95% CI (Exp β)		p	Exp(β)	95% CI (Exp β)	
				Lower	Upper			Lower	Upper
Has soap at home <i>SES</i>	Poorer	Reference				Reference			
	Poor	.62	1.13	.70	1.82	.22	1.36	.84	2.20
	Affluent	.02	1.86	1.10	3.13	.00	3.13	1.76	5.57
	More affluent	.00	3.05	1.74	5.37	.00	3.36	1.87	6.02
Religion	Traditional	Reference				Reference			
	Christian	.00	5.30	3.06	9.15	.00	6.48	2.01	20.92
	Muslim	.00	4.72	2.55	8.72	.02	4.00	1.20	13.28
Age	41 years and +	Reference				Reference			
	36-40 years	.50	.76	.35	1.68	.01	2.63	1.23	5.63
	31-35 years	.27	.67	.33	1.36	.01	2.64	1.30	5.38
	26-30 years	.30	.69	.35	1.38	.03	2.03	1.08	3.83
	21-25 years	.78	1.11	.54	2.30	.04	1.98	1.04	3.75
	18-20 years	.72	.87	.40	1.88	.09	1.94	.91	4.15

5.6. Handwashing

It is easy to spread or contract NTD vectors by touching other people, objects, or surfaces already contaminated. Washing oneself with water and soap remains the best way to prevent spreading diseases and reducing reinfection.

Availability of a Space Dedicated to Handwashing Routinely Used by the Respondent

Generally speaking, in both districts, approximately one in ten respondents does not have a specific place for handwashing; 19 percent of them in Manni and 15 percent in Bogandé usually wash their hands in the family compound.

Among those who usually wash their hands within the family compound, the place varies from one district to the other. For example, 33 percent of respondents in Manni and 38 percent ($p < 0.05$) in Bogandé wash their hands in the compound at ten footsteps away from the latrines, 26 percent in Manni wash their hands elsewhere within the compound or the garden compared to 39 percent ($p < 0.05$) in Bogandé; 28 percent wash their hands in the compound near the kitchen in Manni while only 13 percent ($p < 0.05$) do so in Bogandé.

Furthermore, most handwashing apparatus is removable. Illustratively, the kettle is the most commonly used equipment by households, 56 percent in Manni and 64 percent in Bogandé, followed by the bucket, 15 percent in Manni and 28 percent in Bogandé. Very few households (6%) use a fixed tippy tap in Manni while no household uses it in Bogandé.

Water Availability near the Handwashing System Generally Used

The availability of water near the handwashing apparatus differs by district. Among households with a visible handwashing system, the presence of water was observed in 72 percent of households in Manni compared to 55 percent ($p < 0.05$) in Bogandé, soap was present in 74 percent of households in Manni compared to 43 percent ($p < 0.05$) in Bogandé, and the presence of water and soap at the same time is observed in 56 percent of households in Manni and 33 percent ($p < 0.05$) in Bogandé.

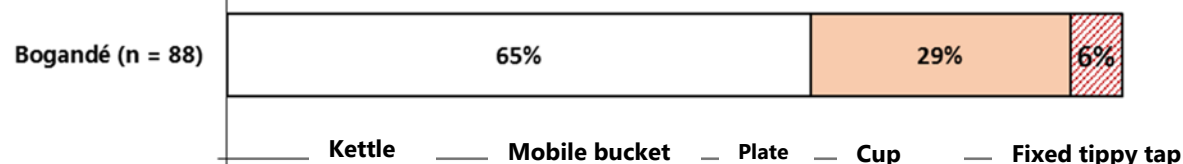
Table 15: Distribution of Households by Type of Handwashing System Generally Used

Handwashing system generally used	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Place and handwashing system generally used by the respondent					
Place to wash hands					
No specific place	527	81%	546	84%	0.90
In the compound	121	19%	97	15%	
No response or unobserved	1	0%	4	1%	
A specific place for handwashing within the compound					
<i>(Among those who reported a place that is within the compound)</i>					
	121		97		0.75
In the compound at 10 footsteps away from the latrines	40	33%	37	38%	
Elsewhere in the compound/garden	31	26%	38	39%	
In the compound near the kitchen	34	28%	13	13%	
Outside the compound/on site	16	13%	9	9%	
Type of fixed handwashing system					
Fixed	6	5%	0	0%	—
Mobile	115	95%	97	100%	
Availability of water near the handwashing system (observation)					
Yes	87	72%	53	55%	0.04
No	34	28%	44	45%	
Availability of soap near the handwashing system (observation)					
Yes	89	74%	42	43%	0.01
No	32	26%	55	57%	
Availability of water and soap container near the handwashing system (observation)					
Yes	68	56%	32	33%	0.04
No	53	44%	65	67%	

Figure 7: Types of Handwashing Systems Generally Used

Disponibilité d'un coin de lavage des mains utilisé par l'enquêtée proche ou près des latrines

En générale, dans les deux districts, très peu de ménages possèdent un dispositif de lavage des mains proche ou près des latrines, 18% à Manni et 13% à Bogandé. Aucun dispositif fixe n'a été observé. La majorité des ménages utilisent la bouilloire (89% à Manni et 81% à Bogandé, et le seau (6% dans les deux districts). Environ 15% des dispositifs à Manni et 11% à Bogandé sont équipés d'eau, de savon ou les deux en même temps.



Availability of a Place for Handwashing, Close to the Latrines, Used by the Respondent

In general, in the two districts, very few households have a handwashing system near or close to the latrines, 18 percent in Manni and 13 percent in Bogandé. No fixed system was observed. The majority of households use a kettle (89% in Manni and 81% in Bogandé) and a bucket (6% in both districts). About 15 percent of systems in Manni and 11 percent in Bogandé are equipped with either water, or soap or both at a time.

Table 16: Distribution of Households by Type of Handwashing System Available Near the Latrines

Handwashing system near latrines	Manni		Bogandé		Kolmogorov Test p (value)
	N = 342		N = 228		
	n	%	n	%	
Handwashing system observed near latrines					
<i>(Among those who reported having access to latrines)</i>					
Presence of handwashing system near latrines					
Yes	60	18%	30	13%	0.69
No	282	82%	198	87%	
Type of handwashing system near latrines					
Fixed	1	0%	0	0%	—
Mobile	341	100%	228	100%	
Availability of water near the handwashing system (observation)					
Yes	58	17%	27	12%	0.52
No	284	83%	201	88%	
Availability of soap near the handwashing system (observation)					
Soap or detergents	52	15%	24	11%	0.78
No	290	85%	204	89%	
Availability of water and soap near the handwashing system (observation)					

Yes	52	15%	24	11%	0.78
No	290	85%	204	89%	

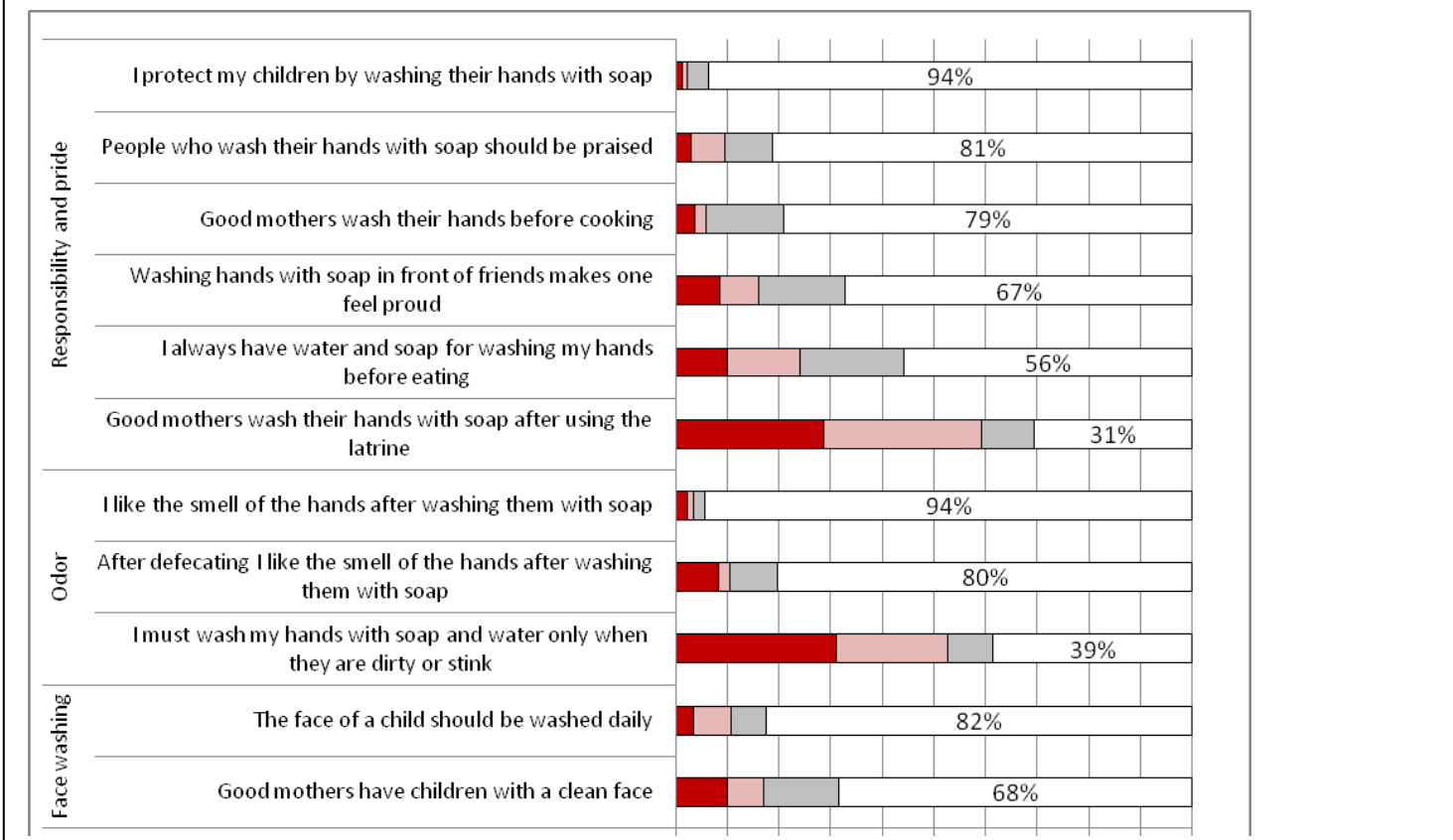
The results in Tables 15 and 16 reveal that the handwashing system located near the latrines is not always the place of handwashing generally used by households.

Psychosocial Determinants of Washing the Hands and the Face

In Burkina Faso, the motivations that prompt respondents to wash their hands with soap or to wash the face of children are (1) respectability and pride, which translates to affection, attention, or maternal love. For example, 94 percent of respondents believe that washing the hands of their children with soap can protect the children who are their pride or happiness, or that such habit represents a distinctive symbol of "good mothers"; 79 percent of respondents think good mothers wash their hands before cooking. Moreover, 81 percent believe that people who wash their hands with soap should be praised and 67 percent consider that the act of washing one's hands in front of their friends makes them feel proud; (2) the smell as important characteristic: for example, 94 percent report that they like the smell of their hands after washing them with soap, 80 percent prefer to wash their hands with soap after using the latrines.

The cleanliness of a child's face is also a distinctive feature of "good mothers"; in fact, 82 percent of respondents believe it is necessary to wash the child's face every day and thus good mothers can be distinguished by the cleanliness of their child's face (68%).

Figure 8 : Psychosocial Determinants of Washing the Hands and the Face



Determinants of Handwashing with Soap at All Key Moments

In both districts, handwashing with soap is practiced by the most affluent households and by respondents who have already heard messages about handwashing. For instance, the wealthiest households were 4.17 times more likely to practice handwashing with soap than the poorest in Manni and 2.51 times more likely in Bogandé. Women who had already received information about handwashing were at least 2.5 times more likely to practice it than those who had not heard such messages.

While in Bogandé religion does not influence the practice of handwashing, in Manni, Christian respondents were 2.94 times more likely to practice it than respondents from traditional religions.

Table 17: Determinants of the Practice of Handwashing with Soap at All Times

Handwashing with soap and its determinants	MODALITIES	Manni				Bogandé			
		p	Exp(β)	95% CI (Exp β)		p	Exp(β)	95% CI (Exp β)	
				Lower	Upper			Lower	Upper
Handwashing with soap at all key moments									
SES	Poorer	Reference				Reference			
	Poor	.35	.79	.48	1.29	.89	1.03	.64	1.68
	Affluent	.31	.77	.46	1.28	.00	2.35	1.34	4.13
	Very affluent	.00	4.17	2.08	8.35	.00	2.51	1.42	4.43
Religion	Traditional	Reference				Reference			
	Christian	.00	2.94	1.68	5.14	.73	.77	.16	3.55
	Muslim	.10	1.66	.91	3.03	.53	.61	.13	2.90
Exposure to information about handwashing	No	Reference				Reference			
	Yes	.01	3.08	2.15	4.41	.01	2.48	1.67	3.71

5.7. Face Washing and Trachoma

It is known that a child's dirty face, the presence of ocular and nasal secretions clearly constitute a source of trachoma infection, because they are very likely to attract flies, and to favor the transmission of trachoma from one person to another, be it a child or an adult. Therefore, using a towel or clean linen to dry the face of a child which has just been washed may point to a best practice in general, but it may also be a protective measure against some NTDs.

In general, the distribution based on the cleanliness of the face of children aged one to nine years remains similar for the two districts, despite some differences (higher percentages in Manni than Bogandé) which are not statistically significant. For example, 15 percent of children have a dirty face in Manni compared to 12 percent in Bogandé; similarly 11 percent of children exhibit nasal secretions in Manni compared to 9 percent in Bogandé and 9 percent have ocular discharge in Manni while only 3 percent in Bogandé.

However, regarding the frequency of a child's face washing, the distribution shows some disparities across districts. The percentage of children who wash their face (or whose face is washed) more than once a day is significantly lower in Manni (70%) than Bogandé (85% (p <0.05). Conversely, the percentage of children who wash their face once a day is significantly higher in Manni 29 percent while this is 14 percent in Bogandé.

The distribution based on the means of drying the face of the child which has been washed is identical in the two districts; a large proportion of children do not dry their faces or let it dry in the open air, 82 percent in Manni and 74 percent in Bogandé. About 12 percent of children in both districts wipe their face with a towel or a cloth.

Among women who reported using a towel or linen for drying the face of their child, the distribution based on the duration of towel or linen use varies by district. In Manni, roughly half the children use the same towel at most once a day, while three in ten children (p <0.05) do the same

in Bogandé. In Manni 30 percent use them for several consecutive days compared to 48 percent ($p < 0.05$) in Bogandé.

In Manni 28 percent of children who were observed had clean hands compared to 31 percent in Bogandé.

Table 18: Distribution of Households by Cleanliness of the Face, Eyes, Nose, Mouth and the Child's Nose

Cleanliness of the face	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Cleanliness of the face, eyes, nose, mouth and hands of the child (observation)					
Dusty or dirty face	99	15%	77	12%	0.89
Eyes with a visible discharge	58	9%	20	3%	0.17
Nose with a visible discharge	73	11%	57	9%	0.73
Mouth with food around (even without eating)	133	20%	80	12%	0.24
Face with flies	45	7%	30	5%	0.85
Dirty hands	182	28%	198	31%	0.62
Frequency of washing the child's face					
More than once a day	453	70%	549	85%	0.58
Once a day	187	29%	92	14%	
Other frequency	9	1%	6	1%	
Way of drying the child's face					
Do not dry / dried by air	530	82%	480	74%	0.62
Towel	48	7%	50	8%	
Linen	31	5%	40	6%	
With the clothes she wears	22	3%	45	7%	
Other (children's cloths, cloth)	3	1%	17	4%	
	79		90		
Duration of use of the towel or linen for drying the child's face before replacing them (Among those who use a towel or cloth)					
Less than a day	23	29%	11	12%	0.04
Once a day	16	20%	17	19%	
Several days	24	30%	43	48%	
More than a week	7	9%	18	20%	
Once a week	6	8%	1	1%	
No response	3	4%	0	0%	

Knowledge of Trachoma

The level of knowledge about trachoma is significantly higher in Manni, where 66 percent of respondents have ever heard of trachoma compared to 50 percent ($p < 0.05$) in Bogandé; 93 percent of respondents in Manni and 77 percent ($p < 0.05$) in Bogandé define trachoma as a disease that causes blindness. Six percent of respondents know no preventive measure against trachoma in Manni compared to 20 percent ($p < 0.05$) in Bogandé.

Table 19: Distribution of Households by Definitions and Means of Preventing Trachoma

Knowledge of trachoma	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Respondents report having heard about trachoma three months prior to the survey					
Yes	429	66%	323	50%	0.04
No	220	34%	324	50%	
<i>(Among those who have ever heard of trachoma)</i>					
	429		323		
Definition of trachoma					
A disease that causes blindness	399	93%	249	77%	0.01
Does not know	27	6%	57	18%	
Other (unspecified)	3	1%	17	5%	
Means of preventing trachoma among children					
Wash the face	286	67%	223	69%	0.04
Ensure cleanliness of the premises	69	16%	9	3%	
Drugs	34	8%	13	4%	
Does not know	25	6%	63	20%	
<i>Other (Do not consume Maggi cubes, healthy diet)</i>	15	3%	15	5%	

5.8. Risky Practices and Schistosomiasis

Refraining from contaminating water with human urines and feces, and reducing direct "man - water" contacts, for example, children's contact with water for recreational purposes (swimming or playing in water) or adults for professional reasons (agriculture, fishing, gold panning) or housework (laundry), are the basic means of fighting schistosomiasis, and reducing transmission and re-contamination, since it is easily transmitted through contaminated water.

Frequency of the Child Swimming in or near a Waterbody

In both districts, the majority of respondents (69% in Manni and 75% in Bogandé) were not able to determine how often their children swim or play in or near a surface waterbody such as rivers, backwaters or other. About 13 percent reported that their children spend time in water less than once a week or once a day.

Places Where Children Usually Urinate

The distribution of places where children usually urinate varies across districts. The proportion of children who urinate in the compound is significantly higher in Manni (61%) than Bogandé (49%, $p < 0.05$); conversely the percentage of children who urinate in any other place is significantly lower in Manni (6%) than Bogandé (16%, $p < 0.05$).

Knowledge of Schistosomiasis

The proportion of respondents who were informed about schistosomiasis is significantly high in Manni (69%) compared to Bogandé (54%, $p < 0.05$). Similarly, a higher percentage of respondents who identify schistosomiasis as a disease that causes the presence of blood in the urine was recorded in Manni (75%) compared to Bogandé (60%, $p < 0.05$).

The distribution of certain knowledge of prevention strategies against schistosomiasis shows also disparities across districts. On the one hand, 73 percent of respondents in Manni declared that one should avoid watercourses compared to 65 percent ($p < 0.05$) in Bogandé; on the other hand, 32 percent in Manni and 41 percent ($p < 0.05$) in Bogandé think that one should not do laundry in rivers, 26 percent in Manni and 38 percent ($p < 0.05$) in Bogandé say one should not urinate in rivers, 17 percent in Manni and 33 percent ($p < 0.05$) in Bogandé mentioned that one must boil or treat the water.

Table 20: Distribution of Households by Definitions and Means of Preventing Schistosomiasis or Bilharzias

Risky practices and knowledge about schistosomiasis	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Frequency at which the child swims, plays near a waterbody					
Does not know	449	69%	486	75%	0.52
Less than once a week	68	10%	44	7%	
Once a day	17	3%	37	6%	
Other frequency	21	3%	37	6%	
No response	94	14%	43	7%	
Places where children usually urinate					
Within the compound	398	61%	318	49%	0.03
On the ground without the compound	93	14%	118	18%	
In the latrines/bathroom	65	10%	85	13%	
Pot	44	7%	1	0%	
No designated place	41	6%	103	16%	
Surface water	2	0%	5	1%	
Other (on clothes etc.)	6	1%	17	3%	
Respondents report having heard about schistosomiasis (bilharzia) three months prior to the survey					
Yes	449	69%	351	54%	0.04
No	200	31%	296	46%	
<i>(Among those who have ever heard about schistosomiasis or bilharzia)</i>					
	449		351		
Definition of schistosomiasis (bilharzia)					
A disease that causes the presence of blood in the urine	338	75%	209	60%	0.04
Does not know	61	14%	68	19%	
A disease causing a swelling of the abdomen and malnutrition	46	10%	39	11%	
Other (unspecified)	4	1%	35	10%	
Prevention against schistosomiasis (bilharzia) (multiple responses)					
Avoid river waters	329	73%	229	65%	0.04
Not play in rivers	201	45%	150	43%	0.69
Not do laundry in rivers	144	32%	143	41%	0.32
Not urinate in rivers	115	26%	135	38%	0.04
Drugs	112	25%	57	16%	0.09
Boil or treat the water	78	17%	116	33%	0.02
Other (drink clean water)	1	0%	7	2%	—

No response

| 6

| 1%

46

13%

—

5.9. Risky Practices and Soil-Transmitted Helminths

At the individual level, reducing direct contact with inert contaminants such as soil and contaminated water is a simple and practical way of preventing contamination by soil-transmitted helminths (worms). Therefore, simple habits such as systematic wearing of shoes, using latrines with clean floors or slabs (with no presence of human feces), practicing handwashing during key moments (before cooking or eating foodstuffs, or after defecating), and not serving children meals or foodstuffs directly on the bare floor are recommended.

Wearing Shoes to Prevent Soil-Transmitted Helminths

Among these recommendations, the regular wearing of shoes by children whenever they leave home is mentioned by a significantly higher proportion of respondents in Manni (71%) than in Bogandé (50%, $p < 0.05$). On the other hand, the proportion of respondents who reported a clean floor of their latrines is significantly lower, 54 percent in Manni and 68 percent ($p < 0.05$) in Bogandé.

Refrain from Serving Children Meals Directly on the Bare Floor to Avoid Soil-Transmitted Helminths

The place where food is served to children is nearly the same in the two districts. For instance, 49 percent of respondents in Manni and 44 percent in Bogandé served their children directly on the bare floor inside or outside the house, 26 percent in Manni and 31 percent in Bogandé mentioned the use of a mat or blanket when they give children food inside the house.

Knowledge about Soil-Transmitted Helminths

The distribution of respondents based on the level of knowledge about soil-borne helminths differs across districts. In Manni 66 percent said they had ever heard information about soil transmitted helminths compared to 46 percent ($p < 0.05$) in Bogandé.

However, common to both districts is that the main strategies to fight soil-borne helminths follow a decreasing order of importance: foodstuffs hygiene (83% in Manni and 80% in Bogandé), washing hands before eating or feeding children (46% in Manni and 49% in Bogandé) or before cooking (38%).

Meanwhile, the proportion of respondents who mentioned not defecating in the open is significantly lower in Manni (13%) than Bogandé (35%, $p < 0.05$), as is the case for those who reported the wearing of shoes (7% in Manni and 40% in Bogandé) or who cited keeping the floor of latrines clean (8% in Manni and 29% in Bogandé), or those who said one must avoid eating on the bare floor (7% in Manni and 20% in Bogandé). Conversely, a significantly higher proportion of respondents cited using drugs in Manni (20%) than in Bogandé (5%, $p < 0.05$).

Table 21: Distribution of Households by Definitions and Means of Preventing Soil-Transmitted Helminths or Intestinal Worms

Risky practices and knowledge about soil-transmitted helminths	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Frequency of wearing shoes whenever the child leaves the house					
Always	459	71%	322	50%	0.03
Sometimes	169	26%	300	46%	
Never	21	3%	25	4%	
Floor Condition / slab of latrines (observation)					
Very clean	185	54%	155	68%	0.04
Relatively clean	98	29%	45	20%	
Dirty and uncleaned	48	14%	19	8%	
No response	11	3%	9	4%	
Place where the child usually eats					
On the bare floor inside house	221	34%	140	22%	0.58
On blankets/mats inside house	171	26%	202	31%	
Other (unspecified)	127	20%	129	20%	
Outside on the bare floor	96	15%	145	22%	
On the terrace	34	5%	31	5%	
Heard about intestinal worms three months prior to the survey					
Yes	430	66%	299	46%	0.03
No	218	34%	348	54%	
No response	1	0%	0	0%	
<i>(Among respondents who heard about intestinal worms)</i>					
	430		299		
Prevention against intestinal worms (multiple responses)					
Keeping Foodstuffs hygienic	357	83%	238	80%	0.87
Washing hands before eating or feeding a child	196	46%	147	49%	0.83
Washing hands before cooking	168	39%	113	38%	0.91
Drugs	84	20%	16	5%	0.02
No defecating in the open	54	13%	105	35%	0.01
Wearing shoes	31	7%	119	40%	0.00
Keeping latrines clean	35	8%	87	29%	0.01
Not eating from the bare floor	32	7%	61	20%	0.02
Other (drink clean water)	2	0%	18	6%	—

5.10. Vectors of Transmission of NTDs and Cleanliness

Some factors associated with the massive presence or abundance of certain NTD transmission vectors such as flies, are the existence of feces, or the presence of livestock or garbage in or near the compound and dwelling place.

The distribution of the presence of human or animal feces in compounds shows some disparities from one district to the other. Feces were observed (more or less) in 76 percent of compounds in Manni and in 54 percent ($p < 0.05$) in Bogandé. Nearly half of the family compounds in Bogandé were clean and displayed no human excreta compared to 24 percent ($p < 0.05$) in Manni.

The same goes for the presence of cattle near the dwelling places. The presence of livestock ten footsteps away from the house is significantly higher (more or less), 72 percent in Manni, compared to 54 percent ($p < 0.05$) in Bogandé.

However, the distribution of the existence of a dustbin is similar in the two districts: less than 15 percent of households own one inside or near their dwelling place.

Table 22: Distribution of Households by Presence of Human and Animal Feces, Animals and Livestock, and Dustbins Inside or Ten Footsteps Away from the House

Determinants of cleanliness of the dwelling place	Manni N = 649		Bogandé N = 647		Kolmogorov Test p (value)
	n	%	n	%	
Visible human and animal feces in the compound (<i>observation</i>)					
Some visible	332	51%	275	43%	0.03
Many visible	162	25%	80	12%	
None visible	154	24%	292	45%	
No response	1	0%	0	0%	
Pets or livestock inside or ten steps away from the house (<i>observation</i>)					
Some	296	46%	295	46%	0.04
Many	169	26%	58	9%	
None	168	26%	210	32%	
No response	16	2%	84	13%	
Dustbin inside or 10 steps away from the house (<i>observation</i>)					
Yes	80	12%	92	14%	0.61
No	557	86%	549	85%	
No response	12	2%	6	1%	

5.11. Exposure to Information on Sanitation

The distribution of exposure to sanitation-related information is nearly similar in the different districts. In both districts, about six in ten respondents were already informed on sanitation promotion activities, mainly using latrines.

Sources of Information on Sanitation

In both districts, the main common source of information on sanitation is the radio for 78 percent of respondents in Manni and 85 percent in Bogandé.

However the distribution of other sources of information shows disparities by district. For example, a significantly higher proportion of respondents in Manni (35%) cited health workers compared to 23 percent ($p < 0.05$) in Bogandé. Conversely, a significantly lower proportion of respondents in Manni (15%) cited the community health workers compared to 28 percent ($p < 0.05$) in Bogandé and other sources such as community meetings, schools or various projects like SaniFaso or Sani-Est, 7 percent cited them in Manni compared to 25 percent ($p < 0.05$) in Bogandé.

Villages that Participated in an ODF Related Activity

The distribution of villages that have participated in an activity related to ODF is almost identical for the two districts, 26 percent of respondents in Manni and 21 percent in Bogandé mentioned the participation of their village in at least one ODF related activity. It is the same for those who reported that their village is free of defecation in the open air (2% in Manni and 8% in Bogandé) as well as those who participated in the walk of shame (7% in Manni and 2% in Bogandé), and those involved in small feasible actions in collaboration with health workers (10% in Manni and 6% in Bogandé).

It is common for both districts that sanitation is a favorable factor in developing the community, about nine of ten respondents strongly agree with this view.

Table 23: Distribution of Households by Exposure to Information Campaigns on Sanitation

Access to information on sanitation	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Respondents who have been exposed to information about the promotion of sanitation (latrines)					
Yes	406	63%	432	67%	0.86
No	243	37%	215	33%	
<i>(Among respondents who have been exposed to information about the promotion of sanitation)</i>					
		406	432		
Sources of information on the promotion of sanitation (multiple responses)					
Radio	317	78%	367	85%	0.54
Health workers	143	35%	98	23%	0.04
Community health workers	61	15%	121	28%	0.04
Other (community meetings, schools, projects)	27	7%	110	25%	0.02
		649	647		
Village participated in an activity relating to ODF					
Yes	169	26%	139	21%	0.67
No	480	74%	508	79%	
Village free of ODF					
Yes	15	2%	55	8%	0.83
No	634	98%	592	92%	
Village participated in the walk of shame					
Yes	44	7%	10	2%	0.88
No	605	93%	637	98%	
Respondents involved in small feasible actions with health workers					
Yes	62	10%	38	6%	0.85
No	587	90%	609	94%	
Respondents who believe that sanitation is good for development					
Totally agree	557	86%	577	89%	0.91
Partially agree	35	5%	23	4%	
Partially disagree	32	5%	6	1%	
Totally disagree	20	3%	40	6%	
Indifferent, no opinion	3	0%	1	0%	

5.12. Exposure to Information on the Promotion of Hand and Face Washing

In both districts, although the distribution of the exposure to information on hand and face washing is nearly the same, in Manni, the proportion of respondents (62%) who declared having ever heard messages promoting handwashing is significantly high compared to those (28%, $p < 0.05$) who received messages on facial cleaning. It is the same in Bogandé where 56 percent of respondents have heard about handwashing compared to 27 percent ($p < 0.05$) who received messages on washing the face.

In both districts, respondents use almost the same sources for information about hand and face washing. In decreasing order of prominence they are the radio, health workers, community workers, and others such as community meetings, projects and the elders.

However, it should be noted that the proportion of respondents who mention the radio is significantly lower in Manni than Bogandé. In fact, the radio was mentioned by 77 percent of respondents in Manni and 94 percent ($p < 0.05$) in Bogandé for handwashing promotion, and by 73 percent of respondents in Manni compared to 91 percent ($p < 0.05$) in Bogandé for face washing promotion.

Table 24: Distribution of Households Regarding their Exposure to Information Campaigns on Handwashing and Face Washing

Access to information promoting handwashing and face washing	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Respondents who have been exposed to information campaigns on handwashing					
Yes	400	62% ^a	363	56% ^a	0.57
No	249	38% ^a	284	44% ^a	
<i>(Among those who have been exposed to information campaigns on handwashing)</i>					
	400		363		
Source of information on handwashing (multiple responses)					
Radio	307	77%	342	94%	0.02
Health workers	111	28%	94	26%	0.93
Community health workers	64	16%	80	22%	0.58
other (community meetings, schools, projects, mass drug administration)	45	11%	24	7%	0.67

Table 24: Distribution of Households Regarding their Exposure to Information Campaigns on Handwashing and Face Washing (Continued)

Access to information promoting hands and face washing	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Respondents who got exposed to information campaigns on handwashing					
Yes	180	28% ^a	173	27% ^a	0.83
No	469	78% ^a	474	73% ^a	
<i>(Among those who have been exposed to information campaigns on handwashing)</i>					
	180		173		
Source of information on handwashing (multiple responses)					
Radio	132	73%	157	91%	0.03
Health workers	82	46%	71	41%	0.89
Community health workers	24	13%	41	24%	0.46
Other (community meetings, projects, projects, elders)	14	8%	14	8%	0.94

^a Significant differences with $p < 0.05$ between the proportion of respondents who have ever heard information on handwashing compared to the proportion of those who received messages on face washing in the same district.

5.13. Exposure to Information Campaigns on Combating Schistosomiasis and Soil-Transmitted Helminths

In both districts, about two in ten respondents have ever heard information campaigns on combating either schistosomiasis or intestinal worms.

The distribution of the source of information on encouraging the fight against both diseases shows disparities from one district to the other, where the proportion of respondents who cited various sources is relatively lower in Manni compared to Bogandé, except for the reference to health workers promoting messages about helminths (44% in Manni and 41% in Bogandé, with no significant difference). The various sources cited are, in decreasing order of importance, the radio, health workers, community workers, and other sources, including community meetings, schools and mass drugs administration sessions.

Table 25: Distribution of Households Regarding their Exposure to Information Campaigns on Fighting Schistosomiasis or Bilharzia

Access to information on schistosomiasis and soil-transmitted helminths	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
Respondents who got exposed to campaigns on fighting schistosomiasis or bilharzias					
Yes	111	17%	120	19%	0.73
No	538	83%	527	81%	
		111	120		
Source of information on fighting schistosomiasis (multiple responses)					
Radio	79	71%	113	94%	0.04
Health workers	49	44%	59	49%	0.82
Community health workers	13	12%	41	34%	0.02
Other (community meetings, schools, mass drug administration)	8	7%	17	14%	0.04
		N = 649	N = 647		
Respondents who were exposed to information campaigns on fighting soil-transmitted helminths or intestinal worms					
Yes	145	22%	158	24%	
No	504	78%	489	76%	
		145	158		
Sources of information on fighting soil-transmitted helminths or intestinal worms (multiple responses)					
Radio	108	74%	144	91%	0.04
Health workers	64	44%	65	41%	0.87
Community health workers	19	13%	33	21%	0.04
Public meetings of village chiefs	13	9%	19	12%	0.04
Other (schools, mass drug administration)	4	3%	6	4%	—

5.14. Exposure to Information Campaigns on Treating Drinking Water and Information from a Reliable Source on Child Health, Water and Sanitation

In both districts, almost three in ten respondents were exposed to information campaigns on treating water for domestic consumption.

The distribution of the sources of information on encouraging water treatment differs across districts and depends on information source. The proportion of respondents is overall significantly lower in Manni than Bogandé, especially the percentage of those who mentioned the radio (68% in Manni and 92% ($p < 0.05$) in Bogandé), community workers (12% in Manni and 29% ($p < 0.05$) in Bogandé) and other sources (8% in Manni and 13% ($p < 0.05$) in Bogandé); conversely the proportion of respondents who cited health workers is significantly higher in Manni (55%) than Bogandé (41%, $p < 0.05$).

Furthermore, respondents were asked to cite channels they considered most reliable or most effective for disseminating messages on child health or on water and sanitation. It may be noted that the proportion of respondents who had no opinion or who were not able to give any answer is significantly higher in Manni than Bogandé. For instance, 73 percent of respondents in Manni and 48 percent in Bogandé ($p < 0.05$) knew no other reliable channel for promoting child health; in Manni 80 percent of respondents did not know either any more effective channel for promoting water and sanitation compared to 64 percent ($p < 0.05$) in Bogandé. However, in both districts, radio or health workers seem to be more reliable channels than community workers and other channels.

Table 26: Distribution of Households with Regards to their Exposure to Information Campaigns on Water Treatment and from Reliable Sources on Child Health, Water and Sanitation

Access to information on water treatment, and to reliable sources on infant health and sanitation	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	%	n	%	
	649		647		
Respondents who have been exposed to information campaigns on water treatment					
Yes	202	31%	182	28%	0.56
No	447	69%	465	72%	
<i>(Among those who have been exposed to information campaigns on water treatment)</i>					
	202		182		
Sources of information on water treatment (multiple responses)					
Radio	137	68%	167	92%	0.01
Health workers	112	55%	75	41%	0.04
Community health workers	24	12%	52	29%	0.03
Other (Community meetings, schools, mass drug administration)	17	8%	23	13%	0.04
	649		647		
Most reliable sources of information on child health					
Has no opinion, does not know	471	73%	309	48%	0.00
Radio	85	13%	104	16%	0.67
Health workers	67	10%	115	18%	0.54
Community health workers	18	3%	78	12%	0.04
Other (community meetings, schools, mass drug administration)	8	1%	41	6%	—
Most reliable sources of information on water and sanitation					
Has no opinion, does not know	517	80%	414	64%	0.01
Radio	42	6%	113	17%	0.03
Health workers	74	11%	86	13%	0.63
Other (Community health workers, community meetings, schools, mass drug administration)	16	2%	34	5%	0.45

5.15. Potential Sources and Means of Information

WASHplus plans to conduct mass sensitization campaigns using various channels, including the radio.

The distribution of the frequency of listening to the radio is similar in the two districts, 75 percent of the respondents in Manni and 72 percent in Bogandé listen to the radio every day or several times a week; 21 percent in Manni and 26 percent in the Bogandé listen to the radio about once or less than once per week.

However, the audience distribution by radio station shows disparities by district. A significantly higher proportion of respondents listen to Djawampo radio stations (96% in Manni and 68% ($p < 0.05$) in Bogandé) and to Eveil (40% in Manni and 19% ($p < 0.05$) in Bogandé). Conversely, Tin Tua radio station is mentioned by a significantly lower proportion of respondents, 20 percent in Manni and 66 percent ($p < 0.05$) in Bogandé. A very small proportion of respondents (< 3 percent) listen to the RTB station in both districts.

The distribution of the frequency of listening to Djawampo and Eveil radio stations is somehow similar in the two districts. Of those who reported listening to these stations, about eight of ten respondents do so daily or several times a week. The distribution of the listening frequency to Tin Tua radio station varies in the two districts; among those who listen to this station in Manni, 95 percent do so daily compared to 61 percent ($p < 0.05$) in Bogandé, and 2 percent listen to it less than once a week in Manni compared to 13 percent ($p < 0.05$) in Bogandé.

Furthermore, the use of new technologies such as mobile phones is increasingly recommended for information, education and communication campaigns in the area of public health.

In both districts, while about nine in 10 households have access to mobile telephony services, the providers of such services vary depending on the district. Telmob is used by a significantly higher proportion of households in Manni (73%) than Bogandé (48%, $p < 0.05$). On the other hand, Telecel is used by a significantly lower proportion of households in Manni (19%) than Bogandé (47%, $p < 0.05$). In addition to these, Airtel services are used by 25 percent of households in Manni and by 30 percent ($p < 0.05$) in Bogandé. Fewer than one in ten households use the services of the three carriers simultaneously (Telmob, Airtel and Telecel), and in both districts about 27 percent use services of two carriers at the same time.

Table 27: Distribution of Households by Frequency of Listening to Radio Channels and by Mobile Phone Services Provider

The use of radio stations and mobile telephones	Manni		Bogandé		Kolmogorov Test p (value)
	N = 649		N = 647		
	n	percent	n	percent	
Frequency of listening to the radio					
Daily	433	67%	361	56%	0.28
Several times a week	61	9%	102	16%	
About once a week	76	12%	65	10%	
Less than once a week	61	9%	101	16%	
Radio station listened to (multiple responses)					
Djawampo	621	96%	439	68%	0.00
Eveil	258	40%	120	19%	0.00
Tin Tua	132	20%	430	66%	0.00
RTB	5	1%	15	2%	—
Frequency of listening to each radio station					
<i>(Among those who reported listening to Djawampo radio station)</i>					
	621		439		
Daily	432	70%	280	64%	0.73
Several times a week	61	10%	67	15%	
About once a week	72	12%	48	11%	
Less than once per week	56	9%	44	10%	
<i>(Among those who reported listening to Eveil radio station)</i>					
	258		120		
Daily	204	79%	85	71%	0.85
Several times a week	16	6%	21	18%	
About once a week	25	10%	5	4%	
Less than once per week	13	5%	9	8%	
<i>(Among those who reported listening to Tin Tua radio station)</i>					
	132		430		
Daily	126	95%	261	61%	0.02
Several times a week	0	0%	74	17%	
About once a week	4	3%	40	9%	
Less than once per week	2	2%	55	13%	
<i>(Among those who reported a mobile telephone)</i>					
	565		565		
Telmob	477	73%	311	48%	0.03
Airtel	165	25%	196	30%	
Telecel	125	19%	307	47%	
Two carriers at a time	95	27%	38	29%	

Conclusions and Recommendations

This study presents the levels of key indicators of the WASHplus project regarding the three WASH-related NTDs: trachoma, schistosomiasis and soil-transmitted helminths. These indicators allow for better identifying risky behaviors that can be addressed or improved through WASH interventions. Considering the results and analyses above, it appears that drinking water infrastructure and improved water sources exist and are used by the majority of the population of the study's two target districts. While the method of storing household drinking water is overall adequate, implementing effective techniques of water treatment at home, requires reinforcement.

Moreover, even though caregiver's knowledge about practical interventions to fight the three NTDs is relatively satisfactory, applying basic hygiene principles along with some key habits that should be fostered in both districts is hindered by problems access to private latrines and adequate handwashing facilities.

The baseline situation observed confirms that integrating NTD prevention interventions will meet an already favorable environment for the component WA (water) in terms of accessibility but requires a strengthening of cooperation and further coordination efforts with key partners for the S (sanitation) and H (hygiene) components.

Table 28 below summarizes key results in Manni and their relevance in identifying adequate campaign messages and shares possible actions or ideas for discussion.

Table 28: Summary of Key Results in Manni and Their Relevance for the Identification of Adequate Campaign Messages and for Actions or Reflection Points

Key results in Manni	Implications	
	Campaign messages	Course of action or reflection points
Other characteristics		
<ul style="list-style-type: none"> -2/3 of households are Christians -43% of respondents are illiterate and -29% have difficulty reading 		<ul style="list-style-type: none"> -No reference to Islamic behavior for benchmark -Design simple and illustrative behavior change (BC) materials
<ul style="list-style-type: none"> -The bicycle is the main means of transportation owned -Followed by the cart and motorcycle -69% of households own a radio -2% have a TV -88% have a mobile phone -Most households share the same compound 		<ul style="list-style-type: none"> -consider problems related to sharing the same compound -consider the possibility of using mobile telephony services
<ul style="list-style-type: none"> -82% to 83% of households raise poultry and sheep, and goats or pigs 	<ul style="list-style-type: none"> -Use images of sheep, goats and pigs to illustrate the BC materials 	
<ul style="list-style-type: none"> -About half of the women had an income generating activity during the last 12 months -Most are merchants -Very few had an income generating activity during the month of the survey 		<ul style="list-style-type: none"> -Focus on women who will be present in the villages
<ul style="list-style-type: none"> -About half of the spouses had an income-generating activity during the last 12 months. The three main ones are: trade, gold panning, farming -Very few had an income generating activity during the month of the survey: most of them are merchants 		<ul style="list-style-type: none"> -Keep in touch with spouses as well and consider working with those who would be available in the villages, depending on the periods of the year.

Key results in Manni	Implications	
	Campaign messages	Course of action or reflection points
Water		
-Water that households use comes mostly from an improved drinking water source (75%). -The main water source cited by households who use an improved source, is the borehole pump or well (73%)	-Use safer water storage techniques	-Provide better access to an improved drinking water source
-Drinking water is not treated at home The main reasons are: -water source is already clean, so no need to treat the water -does not know that the drinking water must be treated -No materials or chemical products for treating the water	-Boil drinking water for 20 minutes to kill all germs, worms or bacteria	
Latrines		
50% of households have access to a latrine -Most use an improved latrine -6 of 10 households share latrines		-Specify the minimum standards of an improved latrine -Identify small feasible actions and ways to diversify or adapt CLTS
-54% of the inspected latrines are clean -85% of the latrines had a hole small enough to secure its use by children		
-Most improved latrines users are satisfied with their current latrine -Main decision maker for building latrines is the husband		-Promote the effective participation of women, and ensure that men get involved
-39% of respondents throw the feces of their young children in the latrines		-Determine other aspects of promoting sanitation. -Identify adequate framing of messages for mothers on managing feces of young children. What should they do?

Key results in Manni	Implications	
	Campaign messages	Course of action or reflection points
<ul style="list-style-type: none"> -Roughly 1 in 10 children use the latrines for urinating -7% use a bedpan 	<ul style="list-style-type: none"> -Wear shoes when using latrines -Keep latrines clean -Do not pee in open water sources 	<ul style="list-style-type: none"> -Adapt the materials on sanitation to the management of urine -Adapt CLTS approaches when defining the standards of appropriateness of latrines for young children
Soap		
<ul style="list-style-type: none"> -77% of respondents buy soap themselves -57% wash their child with soap -The soap is used for multiple purposes 		
<ul style="list-style-type: none"> -57% of respondents always wash their hands with soap -38% never wash their hands with soap 	<ul style="list-style-type: none"> - Promote handwashing with soap before cooking and feeding young children 	
Handwashing system		
<ul style="list-style-type: none"> -None of the handwashing systems is fixed 	<ul style="list-style-type: none"> -Promote systematic use of tippy-tap 	<ul style="list-style-type: none"> -Discuss: <ol style="list-style-type: none"> 1-The presence of water inside or near the latrines 2-To foster the habit: a fixed handwashing system is the best 3-Nurture the concept of "shame" associated with not washing one's hands 4-Train community members on building tippy taps or other fixed handwashing systems
<ul style="list-style-type: none"> -15% of households have water and soap close to the handwashing system located near the latrines 	<ul style="list-style-type: none"> -The fixed tippy tap must be sufficiently filled with water 	

Key results in Manni	Implications	
	Campaign messages	Course of action or reflection points
Face washing and Trachoma		
-28% of children have dirty hands -20% have a mouth with traces of food -99% of children wash their face at least once a day -82% of their faces get dry in open air -Trachoma Prevention Message	-Wash one's face at least two times per day	-Discuss actions to maintain or increase awareness and good practices
-67% of respondents know that they must wash the face of young children		-Discuss: -How to connect face washing with handwashing
Schistosomiasis		
-69% of respondents do not know the frequency with which their children swim, play near or in surface waters		-Identify right formulations of messages to give mothers about places where young children play or swim? -What should they do?
-10% of children urinate in the latrines	-Always use latrines for urination - (No urinating in streams)	-Insist on the idea that this message should be one of the key messages for the fight against schistosomiasis
- Schistosomiasis prevention message -15% know that one should not defecate in the open -None of them mentioned places where young children should urinate and how to manage their urine	-Throw the urine of young children (from a pot or other container) into the latrines	
-32% of respondents know that one should not do laundry in rivers	-Wash clothes at home - (Do not do laundry in the river) -Wear boots for some workers (rice farmers, gold miners)	

Key results in Manni	Implications	
	Campaign messages	Course of action or reflection points
Helminthiasis		
- 71% of children wear shoes outside the house		
- 54% of latrines are clean	- Cleanliness of latrines	
- More than 49% of the surveyed caregivers serve food to their children on the bare floor	- Transmission vectors - The use of mats and tablecloths regardless of the child's age when serving their food.	
- Weak prevention of helminthiasis, aside from food hygiene		- Discuss appropriate actions to raise awareness of best practices
Environment cleanliness		
- 51% of compounds have visible feces - 25% have a lot of visible feces	- Keep environment clean - Keep animals out of the compound or keep them in a pen within the compound Animal sheds with fences (include pictures of poultry, sheep, goats, pigs)	
Exposure to information		
- The majority of the respondents have already heard messages on the use of latrines - More than 60% have heard messages on handwashing		- Discuss appropriate actions to raise awareness of best practices
- Very few have heard messages on face washing, on schistosomiasis, and water treatment		
- Radio and healthcare workers are the two main sources of information - Telmob is the most used mobile operator		- Use all radio campaign media (ads and other strategies) - Discuss with partners - Send illustrated mobile text message - Take advantage of the fact that people also listen to the radio on their mobile

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phones.

It is desirable to operationalize integration activities at two levels, the regional and the district level considering the administrative areas of intervention of each partner to discuss and decide the different courses of action or reflection points formulated in the chart 28, and at the community level (basic healthcare centers or other agencies, commune and village) for their implementation.

At the region/district levels

- ✓ Finalize the formulation and translation of the different campaign messages into local languages (if necessary) as shown in Table 28.
- ✓ Adapt existing BC materials considering the campaign messages in Table 28, and design the campaign materials with more illustrations/photos and less text, to facilitate their use by the population, especially the women, the majority of whom have difficulty reading.
- ✓ Use different media especially radios and mobile telephone networks and services, as results show that they are more commonly used and accessible to the majority of households than TV spots or newspapers;
- ✓ Use different key moments of interaction with the population and women in particular, as potential contacts to ensure broad and good message dissemination and minimize missed opportunities.

At the community level

CSPS or other structures and contact points such as schools

- ✓ Provide training for healthcare workers or other stakeholders involved in WASH and NTD prevention activities, especially those who are involved with NTD prevention activities.
- ✓ Ensure sufficient supply of BC materials.
- ✓ Provide counseling to women and children at key moments of contact with them, either during medical visits of people affected by NTDs or at other occasions, such as drugs distribution sessions at the CSPS.

Communes or Villages (association of water users, HLI groups)

- ✓ Provide counseling to women and children at key moments of contact with them, either during home visits or MDA campaigns.
- ✓ Provide sufficient BC materials.
- ✓ Design and disseminate radio messages.

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Appendix

Estimation of SES

The socioeconomic status (SES) or index of economic well-being of households was constructed from data around the possession of certain assets. For this study, the 13 assets that were considered are availability of electricity, solar panel, radio, television, mobile phone, petroleum or oil lamp, fixed and mobile improved stove, bicycle, motorcycle or scooter, car or truck, a cart with human and animal traction, rickshaw. The availability of each asset was then converted into a binary or categorical variable, depending on possession (value = 2) or not (value = 1) of the asset.

The method based on the principal component (Deon F, 2008) was used to estimate the index.

Therefore, the coordinates of the first Eigen vector obtained by district, were used to determine the weight or importance of each asset (F_j) respectively. The SES index was subsequently estimated with the following formula:

$$I = F_1 \times (B_1 - M_1) / (S_1) + \dots + F_{13} \times (B_{13} - M_{13}) / (S_{13})$$

Where

- I is the value of the SES index
- F_j is the weight of asset j
- B_j is the binary value of asset j
- M_j is the mean value of asset j
- S_j is the value of the standard deviation of asset j

Households were subsequently divided into population quartiles based on their indices. Each quartile corresponds to a level of poverty from the poorest (1) to the most affluent (4).

SPSS syntaxes used:

- IF (Q116_Possede_Panneau_solaire ="Oui") Solaire =1.
- IF (Q116_Possede_Electricite ="Oui") Electr =1.
- IF (Q116_Possede_Radio ="Oui") Radio =1.
- IF (Q116_Possede_Telephone_Mobile ="Oui") Telmob =1.

IF (Q116_Possede_Television = "Oui") TV =1.
 IF (Q116_Possede_lampe_a_petrole = "Oui") Petrol =1.
 IF (Q116_Possede_Foyer_ameliore_fixe = "Oui") Foyerfixe =1.
 IF (Q116_Possede_Foyer_ameliore_mobile = "Oui") Foyermob =1.
 IF (Q116_Possede_Moto_ou_Scooter = "Oui") Moto =1.
 IF (Q116_Possede_Velo = "Oui") Velo =1.
 IF (Q116_Possede_Charrette = "Oui") Charette =1.
 IF (Q116_Possede_Voiture_ou_Camion = "Oui") Voiture =1.
 IF (Q118_Possede_Charrette_traction_ani= "Oui") Tracani =1.
 EXECUTE.

DATASET ACTIVATE DataSet1.

RECODE Solaire Electr Radio Telmob TV Petrol Foyerfixe Foyermob Moto Velo Charette Voiture
 Tracani (1= 2) (0 =1).
 EXECUTE.

* SES Manni

COMPUTE SolaireCoeffManni = (1.01238759376184)* (Solaire- 1.3251155624037).
 COMPUTE ElectrCoeffManni = (2.0763879577077)* (Electr- 1.01540832049307).
 COMPUTE RadioCoeffManni = (1.16286124471682)* (Radio- 1.69183359013867).
 COMPUTE TelmobCoeffManni = (1.43316162422687)* (Telmob- 1.87057010785824).
 COMPUTE TVCoeffManni = (1.79872722037009)* (TV- 1.02003081664099).
 COMPUTE PetrolCoeffManni = (0.115338473129866)* (Petrol- 1.13251155624037).
 COMPUTE FoyerfixeCoeffManni = (0.778672437344312)* (Foyerfixe- 1.12018489984592).
 COMPUTE FoyermobCoeffManni = (1.21121548042793)* (Foyermob- 1.11093990755008).
 COMPUTE MotoCoeffManni = (1.16238818110647)* (Moto- 1.49460708782743).
 COMPUTE VeloCoeffManni = (0.921180525433758)* (Velo- 1.76579352850539).
 COMPUTE CharetteCoeffManni = (1.5395821765939)* (Charette- 1.53929121725732).
 COMPUTE VoitureCoeffManni = (1.26689971341731)* (Voiture- 1.00924499229584).
 COMPUTE TracaniCoeffManni = (1.39495655415484)* (Tracani- 1.36055469953775).
 EXECUTE.

COMPUTE SESMANNI = SolaireCoeffManni + ElectrCoeffManni + RadioCoeffManni +
 TelmobCoeffManni + TVCoeffManni + PetrolCoeffManni + FoyerfixeCoeffManni +
 FoyermobCoeffManni + MotoCoeffManni + VeloCoeffManni + CharetteCoeffManni +
 VoitureCoeffManni + TracaniCoeffManni.
 EXECUTE.

* SES Bogandé

COMPUTE SolaireCoeffBog = (0.789126282275981)* (Solaire- 1.38794435857805).
 COMPUTE ElectrCoeffBog = (2.20945753687231)* (Electr- 1.04945904173107).
 COMPUTE RadioCoeffBog = (0.953050072978549)* (Radio- 1.67697063369397).
 COMPUTE TelmobCoeffBog = (1.42006409127787)* (Telmob- 1.87326120556414).

COMPUTE TVCoeffBog = (2.36120507673067)* (TV- 1.05100463678516).
COMPUTE PetrolCoeffBog = (1.79191600597206)* (Petrol- 1.04173106646059).
COMPUTE FoyerfixeCoeffBog = (1.96998798442394)* (Foyerfixe- 1.05873261205564).
COMPUTE FoyermobCoeffBog = (1.99330719532221)* (Foyermob- 1.04791344667697).
COMPUTE MotoCoeffBog = (1.21661973440543)* (Moto- 1.45595054095827).
COMPUTE VeloCoeffBog = (0.677709517200378)* (Velo- 1.84389489953632).
COMPUTE CharetteCoeffBog = (1.20280910895523)* (Charette- 1.47449768160742).
COMPUTE VoitureCoeffBog = (2.75037760146073)* (Voiture- 1.01391035548686).
COMPUTE TracaniCoeffBog = (1.00905822129912)* (Tracani- 1.43431221020093).
EXECUTE.

COMPUTE SESBOG = SolaireCoeffBog + ElectrCoeffBog + RadioCoeffBog + TelmobCoeffBog +
TVCoeffBog + PetrolCoeffBog + FoyerfixeCoeffBog + FoyermobCoeffBog +
MotoCoeffBog + VeloCoeffBog + CharetteCoeffBog + VoitureCoeffBog +
TracaniCoeffBog.
EXECUTE.