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DELIVERING WATER, SANITATION AND HYGIENE SERVICES  
IN AN UNCERTAIN ENVIRONMENT

**Access to water, sanitation and hygiene: a survey  
assessment of persons with disabilities in rural Mali**

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*This paper presents results from a survey on access to water, sanitation and hygiene (WASH) for persons with disabilities in rural communities of Mali, West Africa. The objective of this survey was to assess numbers and types of [persons with] disabilities in relation to access and use of WASH facilities. Related public attitudes and preferences of persons with disabilities were also assessed within target communities served by World Vision Mali. The survey found that persons with disabilities face considerable constraints in regards to the access and use of most water and sanitation facilities. Specific difficulties related to fetching and transporting water, drawing and pumping water, washing the body and latrine use are explained. The results of the study should serve to fill a major void in reliable, quantitative information on the number and types of disabilities in rural communities of West Africa, especially as they relate to issues of WASH. They also serve to provide much needed baseline information upon which policy, guidelines and infrastructure/technology design can be developed or enhanced so as to assure more equitable access and use of WASH facilities by persons with physical disabilities.*

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## **Introduction**

Disability is a major public health problem in Africa. According to the World Report on Disability (2011), the estimated prevalence rate of moderate and severe disabilities in the total African population is approximately 15.3% (2011). Many development initiatives have historically neglected persons with disabilities (PWD) in the conceptualization, design and implementation of community-enhancement and poverty-alleviation programs. In an effort to examine issues related to PWD, the Conrad N. Hilton Foundation supported a study among World Vision target communities in rural Mali, led by Messiah College in partnership with World Vision Mali (WVM). As the initial phase in the three-year WASH and disability study Messiah College engaged the assistance of Handicap International (HI) to conduct a baseline survey among target communities. Survey results would then be used to develop a research agenda based on the expressed needs of PWD in those communities. The survey was designed to provide a cross-sectional assessment of the scope of the number PWD and the types of disability as they relate to water and latrine use. A working paper on this survey has been prepared by HI, in which demographics and perceptions of and by PWD are given particular detail (Horne et al., 2007). This paper uses the same survey database and serves to supplement HI's report, focusing on those impairments and activity limitations that are directly related to WASH – mainly self-care, visual, and upper- and lower-body impairments.

## **Methodology**

### **Sequence of survey and target population**

This survey was conducted among WVM target communities in the Tominian area of south-central Mali. The Tominian area was selected by WVM because of its designation as a target region for WVM's WASH initiative, its relative ease of access and its central location in Mali. The study designed a two-phase survey instrument to be used in the target communities. In the first phase, heads of households were interviewed to

gather information on the composition of the household, in order to determine if PWD were present. In the second phase, the identified PWD were interviewed personally about their impairments and activity limitations in regards to access to and use of WASH facilities. PWD identified in preliminary assessments were trained to conduct the survey in the various target communities along with WVM staff. The survey was conducted in an area where the majority of the population belongs to the Bwa ethnic group. In Bwa communities, the fetching of water is primarily the responsibility of women and children.

### Sampling method

A cluster sampling method was employed by the study with the individual household as the unit of sampling. The sample was determined on the basis of clusters with a probability of being selected proportional to the size of the cluster. Selection of the final 30 clusters (approximately one village each) from a total of 313 villages was done through unrestricted random sampling. The study sought to have a sample of 900 households, 30 from each of the 30 clusters. (This sampling method followed World Vision's standard Transformational Development Indicators guidelines; World Vision, 2002).

### Disability assessment

The nature of disabilities can be complex, thus making categorization of disabilities equally complex. Throughout the survey, the International Classification of Functioning, Disability and Health (ICF) was used. The ICF classifies problems with human functioning as follows:

- impairments are problems in body function or alterations in body structure – for example, paralysis or blindness;
- activity limitations are difficulties in executing activities – for example, walking or eating;
- participation restrictions are problems with involvement in any area of life – for example, facing discrimination in employment or transportation (ICF, 2001).

## Results and discussion

### Case identification

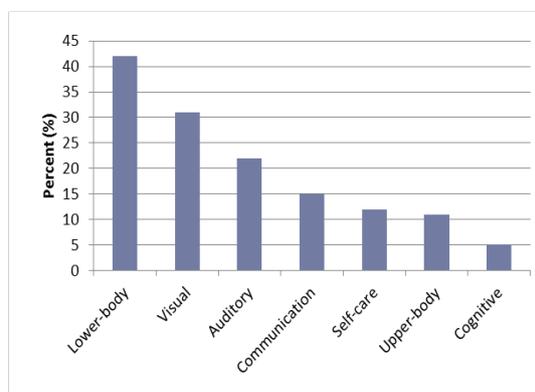
In the first stage of the survey, 870 households representing 7,532 persons were surveyed. From the household survey, 251 PWD, representing 3.3% of the general sample population, were identified. This percentage is lower than the 15.3% prevalence rate estimated by the World Report on Disability (World Bank et al., 2011). The study's exclusive focus on rural areas may explain the reduced percentage of PWD as many PWD migrate to urban areas to find work or charitable support. Although the 3.3% is lower than the WHO estimate, it is slightly higher than the 2.7% reported by the Malian census bureau (Ballo et al., 2001).

Of the identified PWD, 97.2% or 244 individuals, participated in the second stage of the survey. These 244 PWD will serve as the sample population for an analysis of disability characteristics (types of disabilities and socio-demographic characteristics) in the target communities. After discussing disability characteristics, this report will discuss the affect that disabilities have on access to and use of WASH facilities. (When discussing WASH constraints, the sample size will increase to 260 due to the addition of sixteen pregnant women who expressed temporary activity limitations.)

### Disability characteristics

#### Description of disabilities

Figure 1 displays the types and percentages of impairments and activity limitations reported, with the possibility that each individual may have reported one or more depending on their specific condition. About



**Figure 1. Major disabilities categories reported (n=244)**

65% of PWD reported some form of movement or self-care related activity limitation. Persons with lower body impairments most often cited challenges with walking and squatting, while those with upper body impairments cited issues of grasping and lifting objects (such as water receptacles) as their greatest challenges. Fifty-six percent of the PWD sample displayed indications of activity limitations. Eleven percent crawl on their hands and knees. Only 33% of persons with visual impairments indicated they utilize devices such as canes or guides.

### Socio-demographic characteristics

The survey revealed a bi-modal distribution of PWD age groups in the sample (Figure 2), with distribution peaks at 6-15 years and 56-70 years. The data reflect that between the ages of 6-15 years, young people become disabled from various diseases or accidents; in their mid-teens to early 30's, many migrate to urban areas in search of livelihoods (or charitable assistance); and from the mid-50's onward, more community members become disabled due to the effects of aging. Informal discussions with PWD during the study confirmed this hypothesis. It should also be noted here that while lower-body, upper-body and auditory impairments tend to occur earlier in the lives of surveyed PWD, the onset of visual impairments is more associated with advancing age. This bimodal distribution is an important aspect of disability in rural areas, and demonstrates that those age groups most often associated with fetching water (20-50 years approximately) will generally have among them fewer PWD than in urban areas. Moreover, PWD challenged with latrine use in rural areas will most frequently be the young and the elderly.

There are about the same number of male and female PWD, however, there are more single male than single female PWD, and conversely, more female PWD than males are widowed. Men with disabilities often find it difficult to obtain a wife, as demonstration of being able to support a family is often a requisite of the woman's family. The average number of dependents for PWD 15 years old and above was 5. Only 11% have been to school. The adult literacy rate at 18% is notably lower than the national level of 26.2% for those aged 15 and older (United Nations Development Program, 2009). Only about half of the identified PWD (53%) above the age of 15 years indicated they had some form of livelihood, be it a revenue-generating activity (28%) or farming (38%), the latter being mostly men. For those who did not have a livelihood, they often obtained their needs from family (89%), neighbors (28%) or through begging (7%).

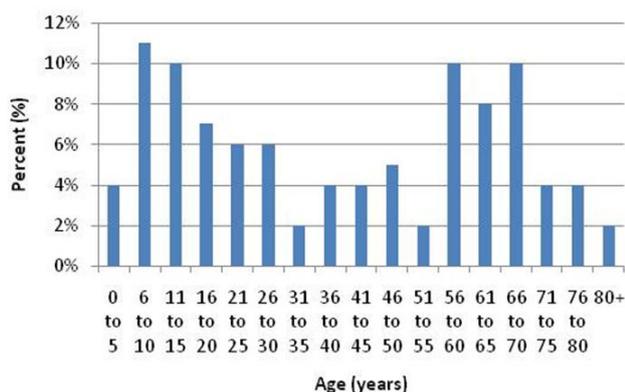


Figure 2. Age distribution of PWD. (n=244)

## WASH and disabilities

### Availability of water

In spite of boreholes and pumps being installed in many villages, the survey indicated that the main water source for 88% of all households in the Tominian area is an open well, with only 11% of households indicating that pumps are their main source. For many this is simply a matter of convenience, as households may often have open wells within or adjacent to their household compound enclosure. Some 95% of PWD who fetch water indicated the most common source to be an open well, largely due to proximity and convenience to their places of residence.

### Fetching water

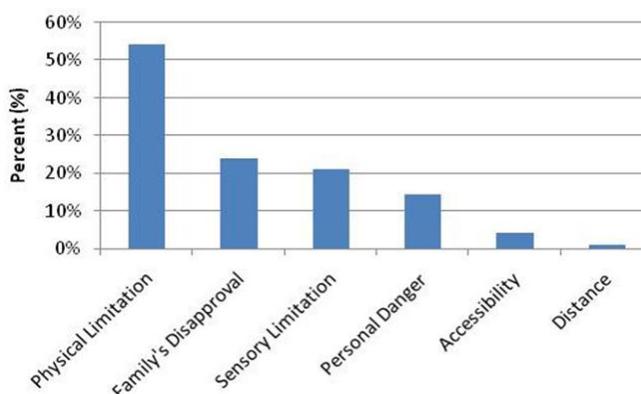
Fetching water can be extremely difficult for PWD. Only 40% of interviewed PWD reported that they fetch water (some more regularly or frequently than others). Among female PWD, some 44% never fetch water while 80% of male PWD report they never fetch water. Among the males, 36% indicated societal reasons (e.g., role divisions), while only 7% of females gave the same reason. Seventy percent of PWD with movement impairments never fetch water; 66% of those with visual impairments never fetch water; and 90% of those with cognitive impairments never fetch water. For all PWD who do not fetch water, figure 3

details the reasons given, with physical limitations and family’s disapproval being the two most common reasons cited. In the course of the study, it was common to hear of strong social biases against female PWD fetching water.

Common reasons given by both family and community members were those of “inability “or “risk of personal injury”; although most female PWD in these cases disagreed and felt that the decision should be their own and not that of family or community.

### Transporting the water

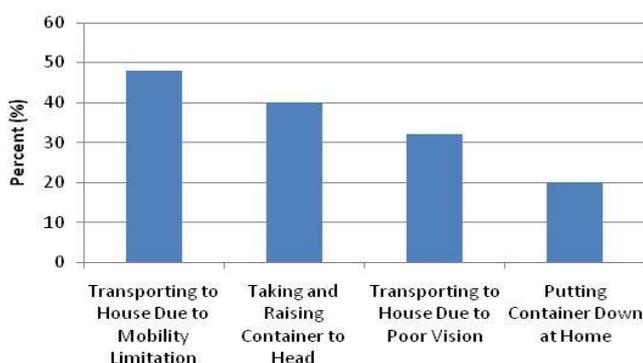
The transport of water from a water source back to the home can be challenging for PWD. The weight of water containers can make this seemingly mundane task extremely difficult for PWD. For PWD who use pumps or boreholes, the location of these facilities may impede PWD’s ability to access them. It was noted that in some of target communities the pump is located just outside the village, or near a school on the edge of town. For most people this means a few minutes’ walk, but for PWD it can preclude their daily use of the water source. In many communities, soils are sandy, making the approach on footpaths, with crutches or cane, or by tricycle or wheelchair very difficult. Returning home from the pump in sandy areas can be even more challenging given the added weight of the full water container on one’s head or on one’s tricycle. Figure 4 details the principal activity limitations PWD face when trying to transport water. The most common issue is that of transportation difficulty due to mobility limitations (48%) followed by lifting the water container to the head (40%).



**Figure 3. Primary obstacles for PWD who do not fetch water themselves. (n=158)**

### Drawing and pumping water

Of the PWD who fetch water, most (90%) draw or pump the water themselves. For those who do not draw or pump the water, nearly half reported the challenge of not being able to hold themselves in a stable position to draw with a rope and bucket or to manipulate the pump handle. PWD who can only stabilize themselves in a sitting position often require assistance from others who are present at the well or someone who meets them at the water source (10%). Others reported lack of upper-body strength to lift or operate the pump handle (30%) or the inability to mount the apron or platform surrounding the well or pump (30%). Only 6% of all interviewed PWD reported using hand-pumps themselves. Most of these also reported the need to use two hands for pumping to stabilize themselves in an upright position. A few PWD reported challenges of removing containers from under the water outlet of the pump and of lifting the full containers.



**Figure 4. Difficulties encountered by PWD when transporting water. (n=25)**

### Sanitation and latrines

#### Washing the body

The majority of surveyed PWD wash themselves at least once a day (95%). However, 37% reported difficulties when bathing. Figure 5 details the most frequently reported challenges while bathing, with

getting water to the bath area being the most cited challenge. Sixty-two percent of those who reported bathing difficulties indicate they require assistance while bathing, most commonly citing limitations with grasping or limitations due to blindness. This dependency increases by 12 times with movement limitations, especially with the inability to grasp objects such as water containers ( $p < .001$ ). PWD with sensory impairments are also more likely to require assistance while bathing (7 times  $p = 0.009$ ).

### Latrine use

Conducting interviews among rural populations about habits of defecation is a sensitive matter, and care must be taken not only when conducting the interviews, but also when analyzing the data. Many individuals (both PWD and the able-bodied, alike) are often ashamed to admit that they do not have access to a latrine or that they experience any form of difficulty in the process of relieving themselves. Analysis and interpretation of collected survey data should therefore take these sensitivities into account.

In this part of rural Mali, more than 60% of households report that they have no latrine. Approximately 35% or less of households report having traditional latrines, with about 5% reporting they have some form of improved latrine such as the sanplat (Sanitary Platform an improved latrine slab with lid). Fifty-eight percent of PWD report either not having or not using a latrine, with most having to go outside their place of residence to relieve themselves in adjacent fields or the bush. In the wet season, PWD report they do not have as far to walk as they often use the crop fields adjacent to their residence for privacy, although at this time they may face the challenge of mud or water on the ground. In the dry season, PWD must go further (usually to the bush) to find places of privacy. For this reason, many report waiting until dark to relieve themselves. Some PWD, and the elderly in particular, who do not have access to a latrine, prefer to use a chamber pot (usually a simple bowl or a bucket) rather than walk great distances, especially in the evening hours. Among these PWD who report they do not use a latrine, 14% indicated challenges of accessing latrines were the main reason for non-use.

Among all surveyed PWD, 42% indicate they use a latrine regularly. Of these PWD who use a latrine regularly, 80% report having a traditional latrine, while others report having some form of improved latrine. Among latrine-using PWD, 85% report having to touch the ground while accessing the latrine or to stabilize themselves when squatting. Only 14% of these report using an assistive device (e.g., a cane). About a quarter of latrine-using PWD, report having significant challenges in the access to and use of latrines.

### Concluding remarks

The results of this survey highlight the challenges faced by some 3-4% of Mali's rural population in relation to WASH. The survey demonstrates the need for greater attention to be given to PWD in WASH initiatives in rural West Africa, and it provides much-needed quantitative data by which future initiatives can be more strategically planned to include the needs of PWD in target communities. The data presented here should generally be representative of most other rural communities in the Sahel region of West Africa.

The findings from this survey were used to inform the activities completed during the remainder of the three-year WVM WASH and disability study, notably research prioritization. Survey data were compiled and findings vetted among focus groups of PWD from target communities. Feedback from this activity led to the identification of the following domains of intervention: access to and use of hand-pumps, transport and domestic use of water and access to and use of latrines. Low-cost technologies designed to assist PWD in each of the three intervention areas were developed, tested and disseminated in WVM target communities. Along with these, guidelines for more inclusive WASH initiatives were also developed. More details are provided in the final report of the 'Mali WASH and Disability Study' (Norman, 2010).

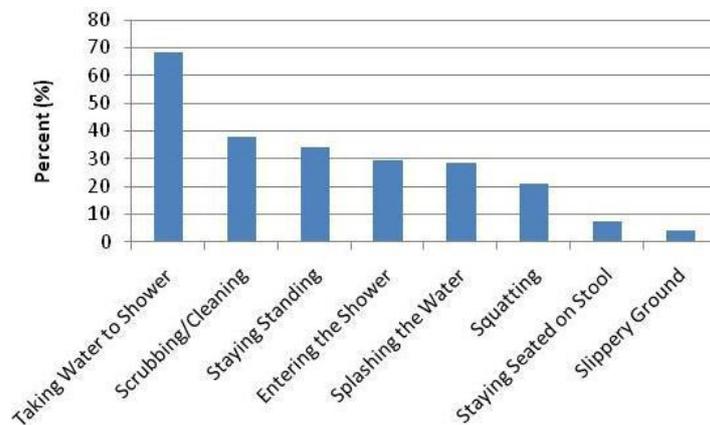


Figure 5. Difficulties encountered by PWD when bathing. (n=91)

Similar surveys are needed in communities of other regions to both confirm and enhance these findings. Particular attention is needed for urban areas where the concentration of PWDs is apparently much higher. The unique challenges faced by women with disabilities (especially those with upper body limitations) with regards to sanitation and personal hygiene also warrant more detailed study. More inquiry and applied testing is needed on how to best apply such findings in the development of more effective WASH programs designed to include/impact PWD. Improvements to the current survey could include questions related to the social and personal perceptions of disability, and utilization of infrastructure (i.e., 'super-structures') associated with human-powered pumps.

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