VII. Water and Sanitation

Safe drinking water is a basic necessity for good health. Unsafe drinking water can be a significant carrier of diseases such as cholera, typhoid, and schistosomiasis. Drinking water can also be tainted with chemical, and physical contaminants with harmful effects on human health. In addition to its association with disease, access to drinking water may be particularly important for women and children, especially in rural areas, who bear the primary responsibility for carrying water, often for long distances[23].

Inadequate disposal of human excreta and personal hygiene is associated with a range of diseases including diarrhoeal diseases and polio and is an important determinant for stunting. Improved sanitation can reduce diarrheal disease by more than a third[24], and can significantly lessen the adverse health impacts of other disorders responsible for death and disease among millions of children in developing countries.

The MDG target(7, C) is to reduce by half, between 1990 and 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. The indicators currently used to monitor progress are the population using an improved source of drinking water and the population using an improved sanitation facility.

For more details on water and sanitation and to access some reference documents, please visit the UNICEF childinfo website[25] or the website of the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation[26].

Use of Improved Water Sources

The distribution of the population by main source of drinking water is shown in Table WS.1. The population using *improved sources* of drinking water are those using any of the following types of supply: piped water (into dwelling, compound, yard or plot, to neighbour, public tap/standpipe), tubewell/borehole, protected well, protected spring, and rainwater collection. Bottled water is considered as an improved water source only if the household is using an improved water source for handwashing and cooking.

[23] *WHO/UNICEF 2012 Progress on Drinking water and Sanitation: 2012 update*
[24] *Cairncross S., Hunt C., Boisson S., et al. 2010. Water, sanitation and hygiene for the prevention of diarrhoea. International Journal of Epidemiology. 39: i193-i205.*
[25] *http://www.childinfo.org/wes.html*
[26] *http://www.wssinfo.org*

Table WS.1: Use of improved water sources

Per cent distribution of household population according to main source of drinking water and percentage of household population using improved drinking water sources, Bangladesh, 2012-2013

		Main source of drinking water																			
		Improved sources									Unimproved sources								Total	Percentage using improved sources of drinking water [1]	Number of household members
		Piped water				Tube well, Borehole	Protected well	Protected spring	Rainwater collection	Bottled water [a]	Unprotected well	Unprotected spring	Tanker-truck	Cart with small tank / drum	Surface water (river, stream, dam, lake, pond, canal, irrigation channel)	Bottled water [a]	Other	Missing			
		Piped into dwelling	Piped into compound, yard or plot	Piped to neighbour	Public tap / standpipe																
Total		**3.1**	**2.5**	**0.2**	**1.2**	**90.6**	**0.3**	**0.0**	**0.1**	**0.0**	**0.3**	**0.1**	**0.0**	**0.0**	**1.4**	**0.0**	**0.3**	**0.0**	**100.0**	**97.9**	**237,396**
Division	Barisal	0.3	0.0	0.0	0.4	94.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	3.4	0.0	1.3	0.0	100.0	95.3	15,028
	Chittagong	1.2	0.6	0.3	1.5	92.5	0.8	0.1	0.1	0.0	1.1	0.4	0.0	0.0	1.4	0.0	0.0	0.0	100.0	97.0	47,725
	Dhaka	8.4	6.8	0.2	1.1	83.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	99.9	72,991
	Khulna	0.1	0.3	0.3	1.6	91.8	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	4.4	0.0	1.0	0.0	100.0	94.4	26,508
	Rajshahi	0.6	1.5	0.1	2.0	94.7	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.4	0.0	100.0	99.3	30,923
	Rangpur	0.3	0.0	0.0	0.4	99.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	100.0	99.9	28,234
	Sylhet	1.8	0.7	0.2	0.8	89.9	0.4	0.0	0.0	0.0	0.7	0.0	0.0	0.0	5.5	0.0	0.0	0.0	100.0	93.8	15,987
Area	Urban	14.0	9.7	0.6	4.4	70.1	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.6	0.0	0.1	0.0	100.0	99.1	49,249
	Rural	0.2	0.6	0.1	0.4	96.0	0.3	0.0	0.1	0.0	0.4	0.1	0.0	0.0	1.6	0.0	0.3	0.0	100.0	97.6	188,147
Education of household head	None	0.5	1.8	0.2	0.5	94.3	0.3	0.0	0.0	0.0	0.4	0.2	0.0	0.0	1.4	0.0	0.2	0.0	100.0	97.7	100,957
	Primary incomplete	1.0	2.9	0.2	1.2	91.3	0.4	0.0	0.1	0.0	0.7	0.1	0.0	0.0	1.8	0.0	0.4	0.0	100.0	97.1	31,273
	Primary complete	1.5	3.6	0.3	0.9	91.5	0.2	0.0	0.0	0.0	0.3	0.0	0.0	0.0	1.5	0.0	0.2	0.0	100.0	98.0	27,398
	Secondary incomplete	3.3	2.8	0.2	1.7	89.7	0.3	0.0	0.1	0.1	0.2	0.0	0.0	0.0	1.4	0.1	0.3	0.0	100.0	98.0	40,319
	Secondary complete or higher	12.7	2.9	0.0	2.8	80.3	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.7	0.0	0.2	0.0	100.0	99.0	37,261
	Missing/DK	2.8	0.0	0.0	0.0	95.1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0	187
Wealth index quintile	Poorest	0.0	0.0	0.0	0.6	93.0	0.7	0.0	0.0	0.0	1.1	0.4	0.0	0.0	3.6	0.0	0.5	0.0	100.0	94.4	47,480
	Second	0.0	0.2	0.1	0.4	96.8	0.3	0.0	0.1	0.0	0.3	0.0	0.0	0.0	1.4	0.0	0.3	0.0	100.0	97.9	47,482
	Middle	0.0	0.4	0.1	0.5	97.4	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.8	0.0	0.2	0.0	100.0	98.7	47,479
	Fourth	0.1	3.4	0.3	0.9	94.4	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.5	0.0	0.2	0.0	100.0	99.3	47,478
	Richest	15.2	8.5	0.3	3.6	71.4	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.5	0.0	0.1	0.0	100.0	99.3	47,478

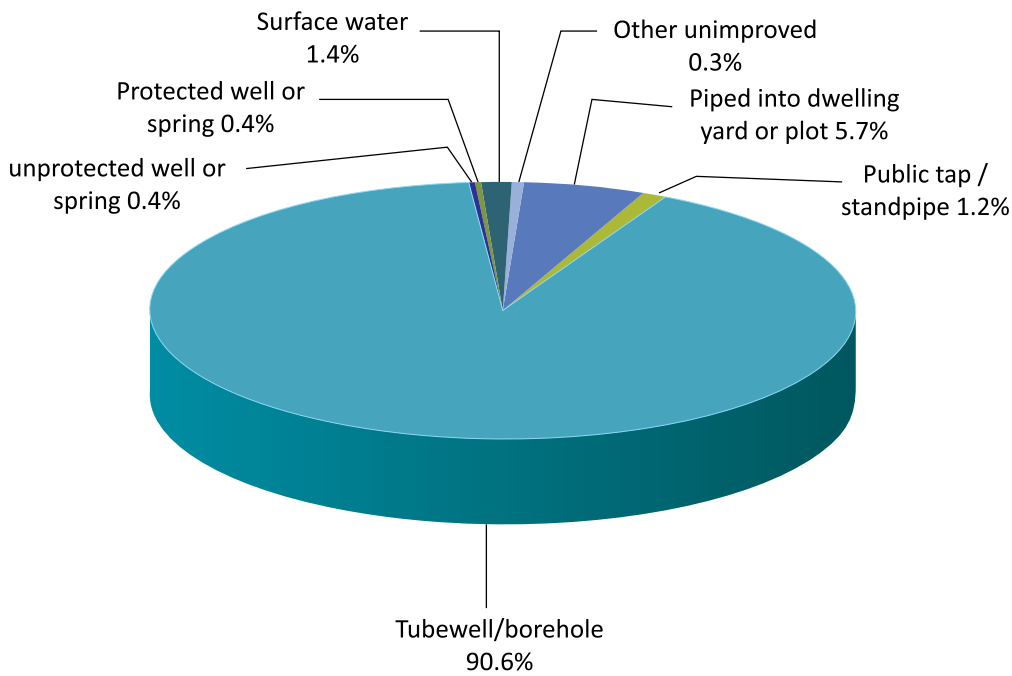
[1] MICS indicator 4.1; MDG indicator 7.8 - Use of improved drinking water sources

[a] Households using bottled water as the main source of drinking water are classified into improved or unimproved drinking water users according to the water source used for other purposes such as cooking and handwashing.

Overall, 97.9 per cent, a majority of Bangladeshi population, were using an improved source of drinking water – 99.1 per cent in urban areas and 97.6 per cent in rural areas. Differences between divisions were not pronounced and the percentage also varied little between different household characteristics.

The prime source of drinking water for the population in Bangladesh as a whole was tube well/ borehole (90.6 per cent). Only 7 per cent of the population was using piped drinking water. There is, however, a large difference between urban and rural areas when we consider the source of water. Over one quarter of the population in urban areas, 28.7 per cent, had drinking water piped-into their dwelling, into their yard or plot, to their neighbour or via a public tap/standpipe, but in rural areas only 1.3 per cent used piped water for drinking. Additionally, a higher proportion of richer households (27.6 per cent) used piped drinking water. Only 0.6 per cent of people living in the poorest households did so.

Figure WS.1: Per cent distribution of household members by source of drinking water, Bangladesh, 2012-2013



Use of household water treatment is presented in Table WS.2. Households were asked about the ways they treat water at home to make it safer to drink. Boiling water, adding bleach or chlorine, using a water filter, and using solar disinfection are considered appropriate methods for improving drinking water quality. The table shows water treatment by all household members and the percentage of household members living in households using unimproved water sources but using appropriate water treatment methods.

In the population that were using unimproved drinking water sources, only 25.6 per cent were using an appropriate water treatment method. Treatment of water by boiling was found to be the most common method. Variations were significant between different divisions (45.1 per cent in Barisal, versus none in Rajshahi and Rangpur), but virtually non-existent between urban and rural Bangladesh. About 45 to 55 per cent of the population with higher education levels of household head or from the richest households used appropriate water treatment methods compared with only 18 to19 per cent in those with the least education level or from poorest households.

Table WS.2: Household water treatment

Percentage of household population by drinking water treatment method used in the household, and for household members living in households where an unimproved drinking water source is used, the percentage who are using an appropriate treatment method, Bangladesh, 2012-2013

		Water treatment method used in the household									Number of household members	Percentage of household members in households using unimproved drinking water sources and using an appropriate water treatment method [1]	Number of household members in households using unimproved drinking water sources
		None	Boil	Add bleach / chlorine	Strain through a cloth	Use water filter	Solar disinfection	Let it stand and settle	Other	Don't know			
Total		**92.0**	**4.8**	**0.1**	**0.8**	**3.1**	**0.0**	**0.6**	**0.5**	**0.0**	**237,396**	**25.60**	**4,934**
Division	Barisal	96.4	2.1	0.2	0.3	0.4	0.0	0.1	1.8	0.0	15,028	45.1	704
	Chittagong	93.2	3.7	0.1	0.9	2.9	0.0	0.0	0.7	0.1	47,725	5.1	1,431
	Dhaka	85.7	11.9	0.0	1.5	3.7	0.0	1.5	0.1	0.0	72,991	16.6	89
	Khulna	92.6	0.4	0.1	0.3	4.7	0.0	0.4	1.5	0.1	26,508	40.7	1,475
	Rajshahi	97.4	0.5	0.0	0.2	1.6	0.0	0.4	0.0	0.0	30,923	0.0	207
	Rangpur	99.0	0.4	0.0	0.0	0.5	0.0	0.1	0.0	0.0	28,234	0.0	37
	Sylhet	89.4	2.0	0.4	1.2	7.7	0.0	0.1	0.3	0.0	15,987	26.2	992
Area	Urban	73.1	20.8	0.1	2.6	8.6	0.0	2.4	0.6	0.1	49,249	26.2	439
	Rural	97.0	0.7	0.1	0.4	1.6	0.0	0.1	0.5	0.0	188,147	25.6	4,495
Main source of drinking water	Improved	92.7	4.7	0.0	0.8	2.8	0.0	0.6	0.2	0.0	232,462	na	na
	Unimproved	58.8	10.1	1.9	4.1	14.5	0.1	0.9	15.7	0.4	4,934	25.6	4,934
Education of household head	None	97.3	1.4	0.0	0.3	0.8	0.0	0.1	0.3	0.0	100,957	17.6	2,276
	Primary incomplete	94.0	2.8	0.0	0.3	2.4	0.0	0.2	0.6	0.0	31,273	23.3	919
	Primary complete	93.5	3.9	0.1	1.0	2.1	0.0	0.5	0.3	0.0	27,398	33.2	543
	Secondary incomplete	90.3	5.3	0.1	1.1	3.6	0.0	0.6	0.8	0.0	40,319	36.7	806
	Secondary complete or higher	76.9	15.9	0.2	2.4	9.9	0.1	2.4	0.7	0.1	37,261	44.6	389
	Missing/DK	91.0	2.8	0.0	0.0	9.0	0.0	0.0	0.0	0.0	187	.	.
Wealth index quintile	Poorest	97.4	0.8	0.1	0.3	0.7	0.0	0.1	0.9	0.0	47,480	19.0	2,669
	Second	98.6	0.4	0.0	0.2	0.5	0.0	0.0	0.4	0.0	47,482	27.9	977
	Middle	98.3	0.5	0.0	0.2	0.8	0.0	0.1	0.3	0.0	47,479	30.6	619
	Fourth	96.4	1.7	0.0	0.4	1.3	0.0	0.1	0.3	0.0	47,478	34.1	348
	Richest	69.5	20.8	0.2	3.0	12.0	0.0	2.6	0.5	0.0	47,478	55.1	321

[1] MICS indicator 4.2 - Water treatment

The amount of time it takes to obtain water is presented in Table WS.3 and the person who usually collected the water in Table WS.4. Note that for Table WS.3, household members using water on premises are also shown in this table and for others, the results refer to one roundtrip from home to drinking water source. Information on the number of trips made in one day was not collected.

Table WS.3: Time to source of drinking water

Per cent distribution of household population according to time to go to source of drinking water, get water and return, for users of improved and unimproved drinking water sources, Bangladesh, 2012-2013

		Time to source of drinking water							Total	Number of household members
		Users of improved drinking water sources				Users of unimproved drinking water sources				
		Water on premises	Less than 30 minutes	30 minutes or more	Missing/DK	Water on premises	Less than 30 minutes	30 minutes or more		
Total		**74.2**	**20.4**	**3.1**	**0.3**	**0.5**	**1.1**	**0.5**	**100.0**	**237,396**
Division	Barisal	29.9	57.0	8.4	0.1	2.3	2.1	0.3	100.0	15,028
	Chittagong	66.2	25.2	5.5	0.2	0.3	1.9	0.8	100.0	47,725
	Dhaka	85.4	13.0	1.0	0.5	0.1	0.0	0.0	100.0	72,991
	Khulna	62.1	27.6	4.7	0.1	0.2	3.1	2.3	100.0	26,508
	Rajshahi	75.6	22.1	1.5	0.1	0.1	0.5	0.0	100.0	30,923
	Rangur	97.0	2.4	0.1	0.4	0.0	0.1	0.0	100.0	28,234
	Sylhet	65.9	21.7	5.9	0.2	3.6	2.1	0.4	100.0	15,987
Area	Urban	83.0	14.4	1.6	0.2	0.3	0.5	0.1	100.0	49,249
	Rural	71.9	22.0	3.4	0.3	0.6	1.3	0.5	100.0	188,147
Education of household head	None	69.8	23.4	4.2	0.3	0.5	1.2	0.6	100.0	100,957
	Primary incomplete	67.8	24.7	4.3	0.3	0.5	1.5	0.9	100.0	31,273
	Primary complete	75.0	20.8	1.9	0.3	0.6	1.1	0.2	100.0	27,398
	Secondary incomplete	78.1	17.6	2.1	0.1	0.6	1.0	0.3	100.0	40,319
	Secondary complete or higher	86.6	11.3	0.9	0.1	0.4	0.5	0.1	100.0	37,261
	Missing/DK	78.7	20.8	0.5	0.0	0.0	0.0	0.0	100.0	187
Wealth index quintile	Poorest	45.0	40.0	8.7	0.7	0.6	3.4	1.6	100.0	47,480
	Second	68.7	25.6	3.4	0.2	0.5	1.1	0.4	100.0	47,482
	Middle	78.6	18.2	1.6	0.2	0.5	0.6	0.2	100.0	47,479
	Fourth	86.4	11.8	0.9	0.1	0.4	0.3	0.1	100.0	47,478
	Richest	92.3	6.4	0.6	0.1	0.5	0.1	0.1	100.0	47,478

Table WS.3 shows that for 74.7 per cent of households, the drinking water source is on the premises, most of which are improved. The availability of water on premises is associated with higher use, better family hygiene and better health outcomes. For a water collection round trip of 30 minutes or more it has been observed that households carry progressively less water and are likely to compromise on the basic drinking water needs of the household[27]. Of those households who do not have the water source on premises, 1 in 5 (21.5%) take less than 30 minutes to get to the water source and collect water, while just 3.6 per cent spend 30 minutes or more for this purpose. About 94 per cent of the rural household members have water in the premises or within 30 minutes from their household. Similarly, as high as 85 per cent of people in the poorest quintile have water on premises or within 30 minutes from their households.

The amount of time taken varies significantly by divisions. In Barisal, some 91.3 per cent of the population have either the source of water on premises or within 30 minutes, while in Rangpur, almost the entire population has water on premises or within 30 minutes distance.

[27] *Cairncross, S. & Cliff, J. L. 1987. Water use and Health in Mueda, Mozambique. Transactions of the Royal Society of Tropical Medicine and Hygiene, 81, 51-4.*

Information about the person who usually collects water in Bangladesh is shown in Table WS.4. For a majority of households (88.8 per cent), an adult female is the person usually collecting water, when the source of drinking water is not on the premises. Adult men collect water in only 5.4 per cent of cases, while for the rest of the households, about 5 per cent of children under age 15 collect water - girls being more likely to collect than boys (3.7 and 0.9 per cent, respectively). In the richest households and households with secondary or higher educated head, there is a higher than average percentage of male adults who collect water - 12 and 11.6 per cent, respectively.

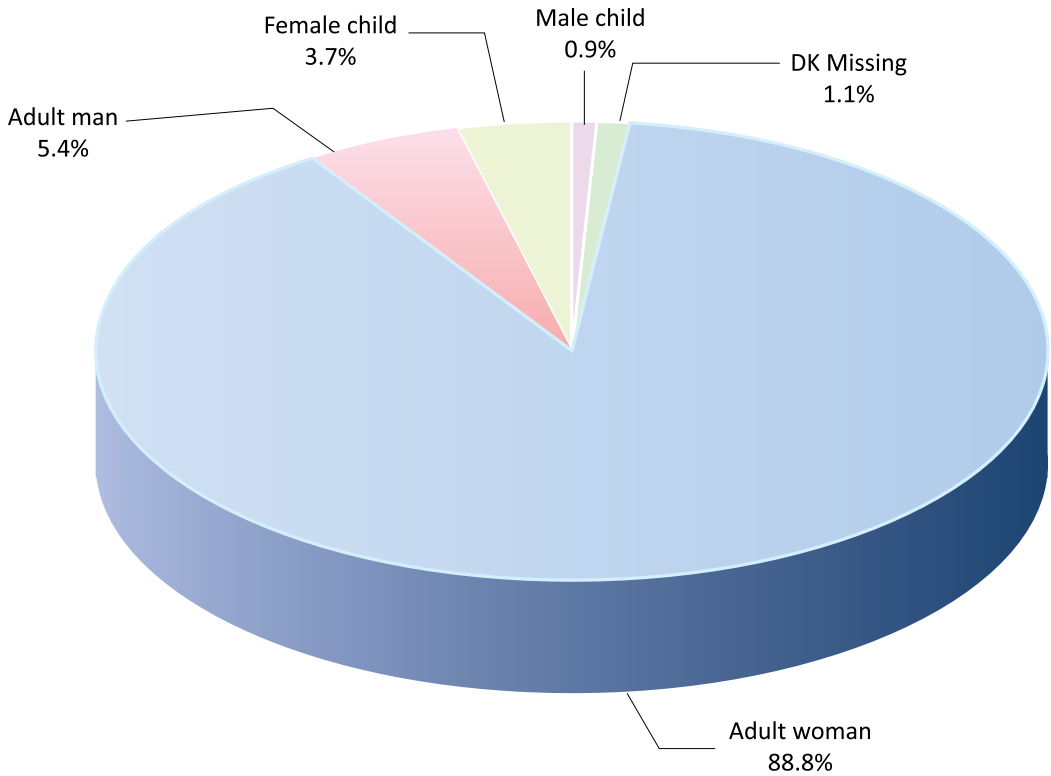
Table WS.4: Person collecting water

Percentage of households without drinking water on premises, and per cent distribution of households without drinking water on premises according to the person usually collecting drinking water used in the household, Bangladesh, 2012-2013

		Percentage of households without drinking water on premises	Number of households	Person usually collecting drinking water							Number of households without drinking water on premises
				Adult woman (age 15+ years)	Adult man (age 15+ years)	Adult man (age 15+ years)	Female child (under 15)	Male child (under 15)	DK and Missing	Total	
Total		**25.1**	**51,895**	**88.8**	**5.4**	**3.7**	**0.9**	**0.1**	**1.0**	**100.0**	**13,040**
Division	Barisal	67.9	3,155	86.7	7.5	4.3	1.4	0.1	0.0	100.0	2,143
	Chittagong	34.0	9,278	86.4	4.5	6.3	2.0	0.1	0.7	100.0	3,153
	Dhaka	14.4	16,556	90.9	4.1	2.7	0.5	0.1	1.6	100.0	2,389
	Khulna	37.8	6,167	88.3	7.2	2.7	0.4	0.2	1.2	100.0	2,330
	Rajshahi	25.3	7,449	92.5	3.8	2.0	0.2	0.1	1.3	100.0	1,885
	Rangpur	3.5	6,454	90.3	5.0	0.9	1.4	0.1	2.2	100.0	226
	Sylhet	32.2	2,836	89.9	5.3	3.2	0.3	0.2	1.2	100.0	914
Area	Urban	16.3	11,144	85.6	7.1	4.1	1.6	0.1	1.5	100.0	1,816
	Rural	27.5	40,751	89.3	5.1	3.7	0.8	0.1	0.9	100.0	11,224
Education of household head	None	29.6	21,823	89.3	4.2	4.2	0.9	0.2	1.2	100.0	6,450
	Primary incomplete	31.9	6,776	89.9	4.5	4.2	0.7	0.1	0.6	100.0	2,164
	Primary complete	23.9	6,053	90.7	4.4	2.9	0.8	0.1	1.0	100.0	1,447
	Secondary incomplete	21.0	8,938	87.9	7.4	2.9	1.1	0.0	0.7	100.0	1,879
	Secondary complete or higher	13.2	8,271	82.7	11.6	2.7	1.7	0.1	1.1	100.0	1,093
	Missing/Dk	(19.3)	34	(*)	(*)	(*)	(*)	(*)	(*)	100.0	7
Wealth index quintile	Poorest	52.7	11,195	89.6	4.6	3.8	0.9	0.1	1.0	100.0	5,899
	Second	29.4	10,510	89.4	4.4	4.2	0.8	0.2	0.9	100.0	3,086
	Middle	20.1	10,163	89.1	4.9	4.0	1.0	0.0	1.0	100.0	2,043
	Fourth	13.0	9,950	87.2	8.5	2.5	1.0	0.1	0.7	100.0	1,289
	Richest	7.2	10,078	82.0	12.0	2.4	2.0	0.1	1.5	100.0	723

( ) Figures that are based on 25-49 unweighted cases
(*) Figures that are based on less than 25 unweighted cases

Figure WS.2: Person usually collecting drinking water when the water source is not within household premises, Bangladesh MICS, 2012-2013



Use of Improved Sanitation

An improved sanitation facility is defined as one that hygienically separates human excreta from human contact. Improved sanitation facilities for excreta disposal include flush or pour flush to a piped sewer system, septic tank, or pit latrine; ventilated improved pit latrine, pit latrine with slab, and use of a composting toilet. The data on the use of improved sanitation facilities in Bangladesh are provided in this report in Table WS.5.

Seventy seven per cent of the population of Bangladesh is living in households using improved sanitation facilities (Table WS.5). This percentage is 86.3 per cent in urban areas and 74.4 per cent in rural areas. Residents of Barisal division are particularly less likely than others to use improved facilities (58.8 per cent). The table indicates that use of improved sanitation facilities is strongly correlated with wealth, 95.8 per cent in the richest households use improved sanitation facilities whereas only half of 45.6 per cent, use in the poorest households.

The type of facilities being used by households varies widely. In rural areas, 47.3 use pit latrine with slab, while in urban areas 42 per cent use flush toilets with connection to a sewage system or septic tank. The percentage of population without any toilet facility, though overall low at 3.9 per cent, is still significant among the poorest households (13.5 per cent), and in Rangpur division (15.5 per cent) among others. Pit latrine without slab/open pit is the most prevalent (11.6 per cent) among the unimproved facility.

Table WS.5: Types of sanitation facilities

Per cent distribution of household population according to type of toilet facility used by the household, Bangladesh, 2012-2013

		Type of toilet facility used by household														Total	Number of household members
		Improved sanitation facility							Unimproved sanitation facility						No facility, Bush, Field		
		Flush / Pour flush				Ventilated Improved Pit latrine (VIP)	Pit latrine with slab	Composting toilet	Flush to somewhere else	Pit latrine without slab / Open pit	Bucket	Hanging toilet, Hanging latrine	Other	Missing			
		Flush to piped sewer system	Flush to septic tank	Flush to pit (latrine)	Flush to unknown place / Not sure / DK where												
Total		**3.2**	**14.9**	**11.2**	**0.5**	**3.5**	**43.5**	**0.1**	**1.5**	**11.6**	**0.0**	**5.8**	**0.3**	**0.1**	**3.9**	**100.0**	**237,396**
Division	Barisal	0.1	4.7	3.5	0.1	0.5	49.9	0.0	0.1	26.8	0.0	12.9	0.1	0.0	1.3	100.0	15,028
	Chittagong	0.6	13.9	15.9	0.2	4.9	39.4	0.1	1.8	14.2	0.0	6.0	0.6	0.1	2.3	100.0	47,725
	Dhaka	9.8	18.3	9.0	1.3	1.7	40.0	0.0	2.3	9.7	0.0	5.8	0.3	0.0	1.8	100.0	72,991
	Khulna	0.3	14.2	7.1	0.1	8.6	51.7	0.1	1.6	13.8	0.0	1.3	0.4	0.1	0.8	100.0	26,508
	Rajshahi	0.2	16.3	8.7	0.0	7.5	47.4	0.0	0.4	7.7	0.0	4.7	0.4	0.1	6.4	100.0	30,923
	Rangpur	0.0	4.9	14.8	0.0	0.4	54.3	0.2	0.2	8.1	0.0	1.4	0.2	0.0	15.5	100.0	28,234
	Sylhet	0.2	27.4	20.0	0.1	0.0	25.1	0.1	3.0	7.6	0.1	15.6	0.0	0.0	0.8	100.0	15,987
Area	Urban	15.2	26.8	10.3	1.8	3.4	28.7	0.1	3.5	6.1	0.0	2.1	0.5	0.1	1.4	100.0	49,249
	Rural	0.1	11.7	11.5	0.1	3.6	47.3	0.1	1.0	13.0	0.0	6.7	0.3	0.0	4.6	100.0	188,147
Education of household head	None	1.0	7.3	9.7	0.3	2.0	48.0	0.1	1.5	14.5	0.0	8.9	0.3	0.0	6.2	100.0	100,957
	Primary incomplete	2.1	11.2	10.2	0.5	3.8	46.4	0.1	1.5	14.0	0.1	6.4	0.4	0.1	3.3	100.0	31,273
	Primary complete	2.8	14.0	12.3	0.4	4.3	44.4	0.0	1.8	11.5	0.0	4.9	0.3	0.1	3.2	100.0	27,398
	Secondary incomplete	3.4	20.3	13.5	0.4	4.8	41.5	0.0	1.4	9.3	0.0	2.6	0.3	0.0	2.3	100.0	40,319
	Secondary complete or higher	10.2	33.2	13.0	1.1	5.3	30.1	0.0	1.5	4.1	0.0	0.8	0.2	0.1	0.5	100.0	37,261
	Missing/DK	0.0	20.0	6.8	0.0	3.5	39.0	0.0	0.0	15.0	0.0	13.5	0.0	0.0	2.2	100.0	187
Wealth index quintile	Poorest	0.0	0.9	3.9	0.0	0.7	40.0	0.1	0.6	22.4	0.1	17.3	0.4	0.0	13.5	100.0	47,480
	Second	0.0	2.9	8.8	0.1	1.6	56.6	0.1	0.9	16.9	0.0	7.2	0.3	0.1	4.5	100.0	47,482
	Middle	0.1	6.1	13.7	0.1	3.0	58.8	0.1	1.2	11.9	0.0	3.5	0.2	0.0	1.2	100.0	47,479
	Fourth	1.4	19.3	18.3	0.6	6.1	44.9	0.1	2.2	5.7	0.0	0.7	0.4	0.1	0.3	100.0	47,478
	Richest	14.5	45.2	11.3	1.6	6.2	17.0	0.0	2.7	1.0	0.0	0.1	0.3	0.1	0.0	100.0	47,478

The WHO / UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation which is responsible for monitoring MDG targets classify otherwise acceptable sanitation facilities which are public or shared between two or more households as unimproved. Therefore, "use of improved sanitation" is used both in the context of this report and as an MDG indicator to refer to improved sanitation facilities, which are not public or shared. Data on the use of improved sanitation are presented in Tables WS.6 and WS.7.

As shown in Table WS.6, 76.8 per cent of the household population is using an improved sanitation facility. About 21 per cent use an improved toilet facility that is public or shared with other households. Urban households are more likely than rural households to use a shared a toilet facility of an improved type (27.8 per cent and 19.1 per cent, respectively). Only 26.2 per cent of the poorest households use an improved latrine which is not shared compared to the 55.9 per cent overall and 80 per cent of the richest households. Of the 19.3 per cent households using unimproved sanitation facility, about 6 per cent use a public or a shared facility.

The table indicates that use of improved sanitation facility that are not shared is strongly correlated to wealth level of the household. 80 per cent of the population in the richest households had access to such improved sanitation facilities, whereas only 26.2 per cent in the poorest households had this access.

Figure WS.3: Per cent distribution of household members by use and sharing of sanitation facilities, Bangladesh, 2012-2013

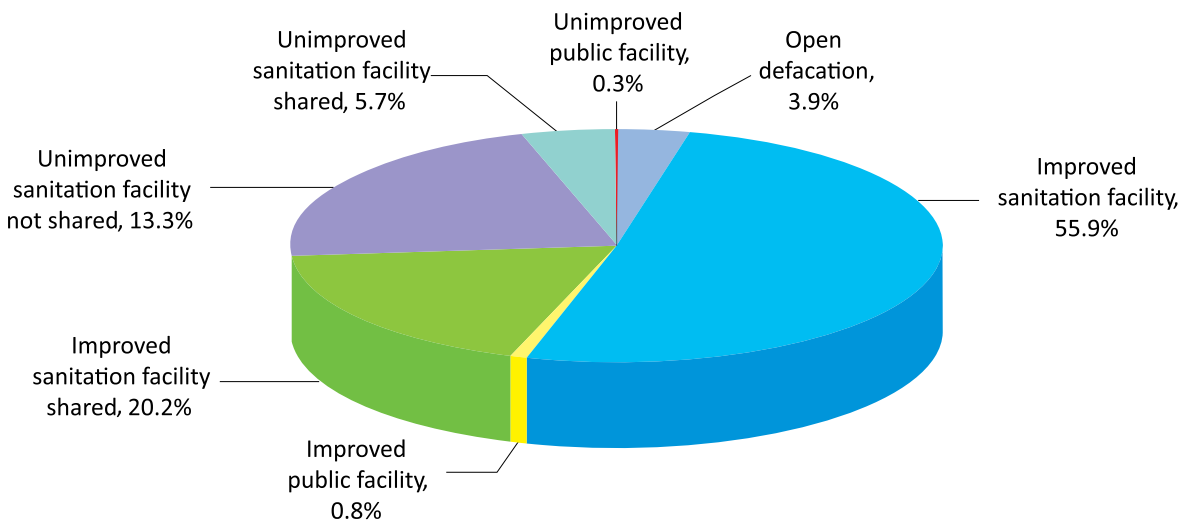


Table WS.6: Use and sharing of sanitation facilities

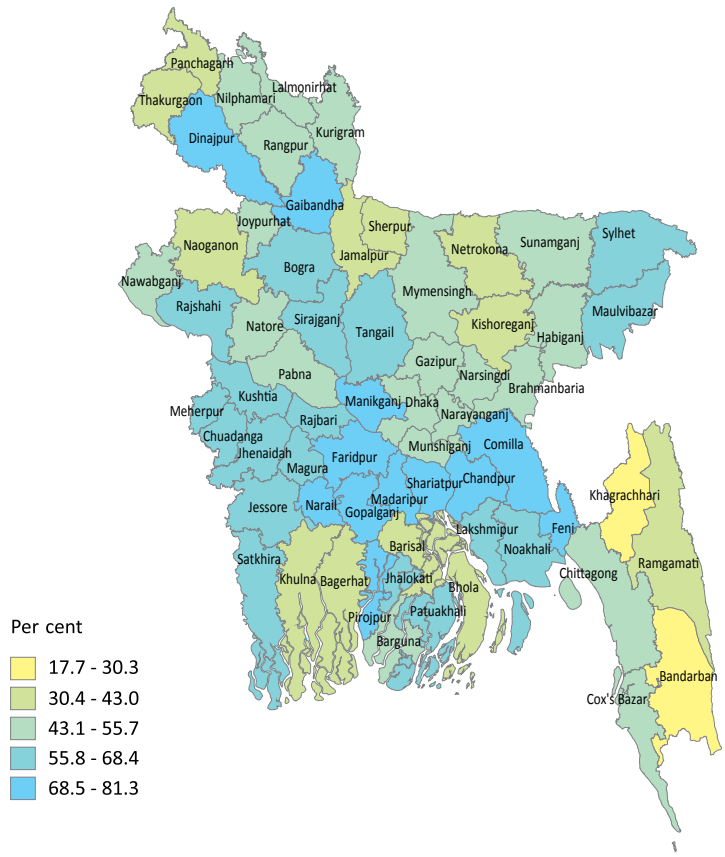
Per cent distribution of household population by use of private and public sanitation facilities and use of shared facilities, by users of improved and unimproved sanitation facilities, Bangladesh, 2012-2013

		Users of improved sanitation facilities					Users of unimproved sanitation facilities					Open defecation (no facility, bush field)	Total	Number of household members
		Not shared [1]	Public facility	Shared by: 5 households or less	Shared by: More than 5 households	Missing/DK	Not shared	Public facility	Shared by: 5 households or less	Shared by: More than 5 households	Missing/DK			
Total		**55.9**	**0.8**	**18.2**	**2.0**	**0.0**	**13.3**	**0.3**	**5.1**	**0.6**	**0.0**	**3.9**	**100.0**	**237,396**
Division	Barisal	52.0	0.1	6.5	0.2	0.0	34.0	0.1	5.6	0.2	0.0	1.3	100.0	15,028
	Chittagong	59.4	0.6	13.3	1.6	0.0	16.6	0.2	4.8	1.1	0.0	2.3	100.0	47,725
	Dhaka	54.0	1.4	20.5	4.2	0.0	11.3	0.5	5.5	0.8	0.0	1.8	100.0	72,991
	Khulna	58.0	0.2	22.5	1.3	0.0	12.6	0.0	4.3	0.3	0.0	0.8	100.0	26,508
	Rajshahi	52.0	0.7	27.0	0.5	0.0	7.3	0.0	5.8	0.1	0.0	6.4	100.0	30,923
	Rangpur	57.4	0.3	16.5	0.3	0.1	6.3	0.0	3.5	0.1	0.0	15.5	100.0	28,234
	Sylhet	58.6	0.6	12.3	1.3	0.1	17.9	0.7	6.6	1.0	0.0	0.8	100.0	15,987
Area	Urban	58.6	2.1	19.6	6.1	0.0	7.0	0.6	3.3	1.3	0.0	1.4	100.0	49,249
	Rural	55.2	0.4	17.8	0.9	0.0	14.9	0.2	5.6	0.4	0.0	4.6	100.0	188,147
Education of household head	None	47.9	0.7	18.2	1.7	0.0	17.3	0.4	6.8	0.8	0.0	6.2	100.0	100,957
	Primary incomplete	50.2	1.0	20.7	2.3	0.0	15.5	0.4	5.8	0.7	0.0	3.3	100.0	31,273
	Primary complete	53.3	0.9	21.3	2.6	0.0	12.8	0.1	5.1	0.6	0.0	3.2	100.0	27,398
	Secondary incomplete	61.2	0.9	19.1	2.8	0.0	9.5	0.1	3.6	0.5	0.0	2.3	100.0	40,319
	Secondary complete or higher	78.4	0.5	13.0	1.0	0.0	4.8	0.1	1.5	0.3	0.0	0.5	100.0	37,261
	Missing/DK	43.9	0.0	25.5	0.0	0.0	25.3	0.0	3.2	0.0	0.0	2.2	100.0	187
Wealth index quintile	Poorest	26.2	0.5	18.2	0.7	0.1	28.8	0.3	11.0	0.8	0.0	13.5	100.0	47,480
	Second	47.3	0.6	21.0	1.2	0.0	17.7	0.2	6.9	0.6	0.0	4.5	100.0	47,482
	Middle	58.5	0.5	21.6	1.2	0.0	11.4	0.4	4.7	0.4	0.0	1.2	100.0	47,479
	Fourth	67.4	1.1	18.7	3.4	0.0	5.7	0.4	2.0	1.0	0.0	0.3	100.0	47,478
	Richest	80.0	1.1	11.5	3.2	0.0	2.8	0.1	0.9	0.3	0.0	0.0	100.0	47,478

[1] MICS indicator 4.3; MDG indicator 7.9 - Use of improved sanitation

Map WS.1 gives a spatial distribution of availability of improved sanitation facilities to households in the districts of Bangladesh. Khagrachari and Bandarban performed worst among the districts of Bangladesh.

Map WS.1: Percentage of households with improved sanitation facility by district, Bangladesh, 2012-2013



In its 2008 report[28], the JMP developed a new way of presenting the access figures, by disaggregating and refining the data on drinking-water and sanitation and reflecting them in "ladder" format. This ladder allows a disaggregated analysis of trends in a three rung ladder for drinking-water and a four-rung ladder for sanitation. For sanitation, this gives an understanding of the proportion of population with no sanitation facilities at all – who revert to open defecation, of those reliant on technologies defined by JMP as "unimproved," of those sharing sanitation facilities of otherwise acceptable technology, and those using "improved" sanitation facilities.

Having access to both an improved drinking water source and an improved sanitation facility brings the largest public health benefits to a household[29,30]. Table WS.7 presents the percentages of household population by drinking water and sanitation ladder. The table also shows the percentage of household members using both improved sources of drinking water[31] and an improved sanitary means of excreta disposal.

Overall, 55.1 per cent household population of Bangladesh have improved drinking water sources and improved sanitation (Table WS.7). The percentages are a little higher in urban areas than in rural areas (58.2 versus 54.3 per cent) and the differential are also limited between divisions. Table shows that there is a positive correlation with the education of household head, as well as with the wealth status of household. Some 79.4 per cent population living in the richest households use drinking water from improved sources and also use improved sanitation facilities, whereas in the poorest households, the percentage using both is reduced to only 25.3 per cent.

[28] *WHO/UNICEF JMP (2008), MDG assessment report - http://www.wssinfo.org/fileadmin/user_upload/resources/1251794333-JMP_08_en.pdf*
[29] *Wolf, J, Prüss-Ustün, A, Cumming, O, et al. Systematic review: Assessing the impact of drinking water and sanitation on diarrhoeal disease in low- and middle-income settings: systematic review and meta-regression. 2014. Tropical Medicine and International Health.*
[30] *DfID Water, Sanitation and Hygiene: Evidence Paper. 2013. http://r4d.dfid.gov.uk/pdf/outputs/sanitation/WASH-evidence-paper-april2013.pdf*
[31] *Those indicating bottled water as the main source of drinking water are distributed according to the water source used for other purposes such as cooking and handwashing.*

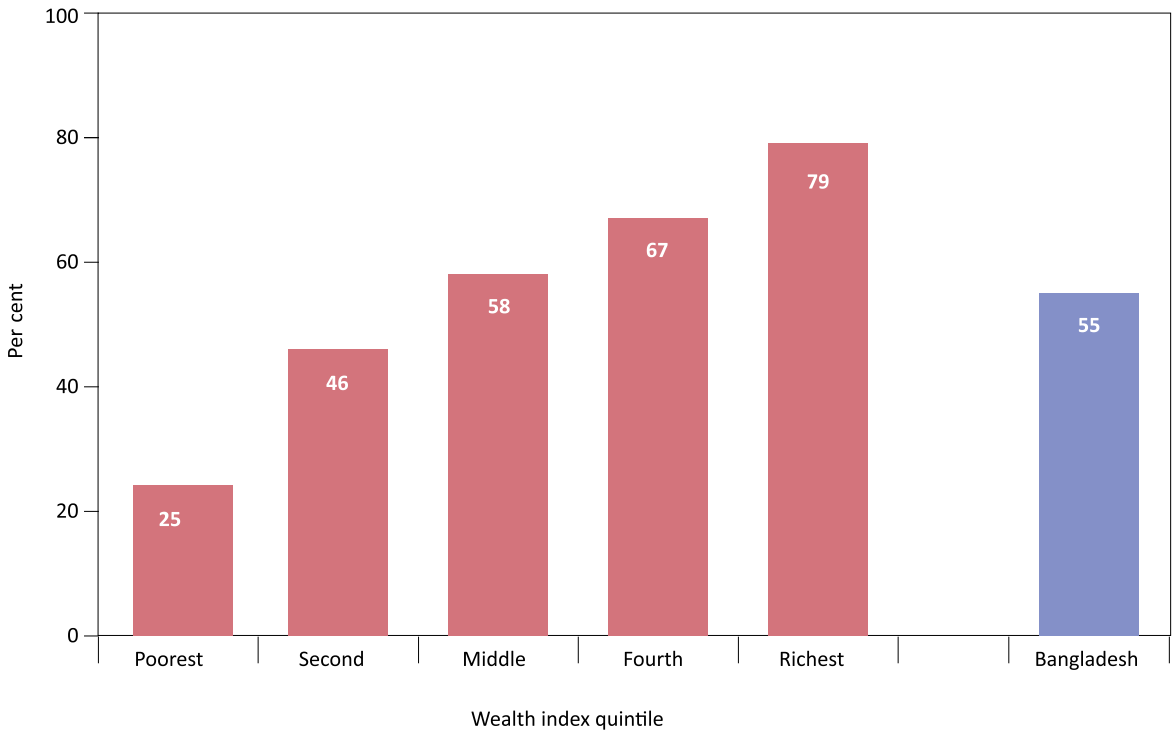
Table WS.7: Drinking water and sanitation ladders

Percentage of household population by drinking water and sanitation ladders, Bangladesh, 2012-2013

		Percentage of household population using:										Number of household members
		Improved drinking water [1]		Unimproved drinking water	Total	Improved sanitation [2]	Unimproved sanitation			Total	Improved drinking water sources and improved sanitation	
		Piped into dwelling, plot or yard	Other improved				Shared improved facilities	Unimproved facilities	Open defecation			
Total		**5.6**	**92.4**	**2.1**	**100.0**	**55.9**	**21.0**	**19.2**	**3.9**	**100.0**	**55.1**	**237,396**
Division	Barisal	0.3	95.0	4.7	100.0	52.0	6.8	39.9	1.3	100.0	49.0	15,028
	Chittagong	1.8	95.2	3.0	100.0	59.4	15.6	22.7	2.3	100.0	59.0	47,725
	Dhaka	15.1	84.8	0.1	100.0	54.0	26.1	18.1	1.8	100.0	53.9	72,991
	Khulna	0.4	94.0	5.6	100.0	58.0	24.0	17.2	0.8	100.0	55.9	26,508
	Rajshahi	2.1	97.2	0.7	100.0	52.0	28.2	13.3	6.4	100.0	51.7	30,923
	Rangpur	0.3	99.6	0.1	100.0	57.4	17.2	9.8	15.5	100.0	57.4	28,234
	Sylhet	2.5	91.3	6.2	100.0	58.6	14.4	26.3	0.8	100.0	55.8	15,987
Area	Urban	23.7	75.4	0.9	100.0	58.6	27.8	12.2	1.4	100.0	58.2	49,249
	Rural	0.8	96.8	2.4	100.0	55.2	19.2	21.1	4.6	100.0	54.3	188,147
Education of household head	None	2.3	95.4	2.3	100.0	47.9	20.6	25.3	6.2	100.0	47.3	100,957
	Primary incomplete	3.8	93.2	2.9	100.0	50.2	24.0	22.4	3.3	100.0	49.2	31,273
	Primary complete	5.1	92.9	2.0	100.0	53.3	24.8	18.6	3.2	100.0	52.4	27,398
	Secondary incomplete	6.0	92.0	2.0	100.0	61.2	22.9	13.7	2.3	100.0	60.3	40,319
	Secondary complete or higher	15.6	83.3	1.0	100.0	78.4	14.5	6.6	0.5	100.0	77.7	37,261
	Missing/DK	2.8	97.2	0.0	100.0	43.9	25.5	28.4	2.2	100.0	43.9	187
Wealth index quintile	Poorest	0.0	94.4	5.6	100.0	26.2	19.4	40.8	13.5	100.0	25.3	47,480
	Second	0.2	97.8	2.1	100.0	47.3	22.9	25.4	4.5	100.0	46.3	47,482
	Middle	0.4	98.3	1.3	100.0	58.5	23.4	16.9	1.2	100.0	57.8	47,479
	Fourth	3.5	95.8	0.7	100.0	67.4	23.3	9.0	0.3	100.0	66.8	47,478
	Richest	23.7	75.6	0.7	100.0	80.0	15.9	4.1	0.0	100.0	79.4	47,478

[1] MICS indicator 4.1; MDG indicator 7.8 - Use of improved drinking water sources
[2] MICS indicator 4.3; MDG indicator 7.9 - Use of improved sanitation

Figure WS.4: Use of improved drinking water sources and improved sanitation facilities, by wealth, Bangladesh, 2012-2013



Safe disposal of a child's faeces is disposing of the stool, by the child using a toilet or by rinsing the stool into a toilet or latrine. Putting disposable diapers with solid waste, a very common practice in some parts of the world, has thus far been classified as an inadequate means of disposal of child faeces for concerns about unsafe disposal of solid waste itself. This classification is currently under review. Disposal of faeces of children 0-2 years of age is presented in Table WS.8.

In Bangladesh, for 38.7 per cent children of age 0-2 years, the stools were disposed of safely the last time they passed stools. The percentage was much higher in urban areas than in rural areas (60.2 versus 33.1 per cent), and significant differences were observed in the practice in different divisions (lowest in Rangpur 21.4 per cent and highest in Dhaka 46 per cent). The percentage of safe disposal of stools progressively improves with the education level for mothers and wealth status of the household - from 24.2 per cent when mothers have no education to 66 per cent for mothers with secondary or higher education. Safe disposal of stools is as low as 19.6 per cent in the poorest households as compared to 73.1 per cent households in the richest wealth quintile.

By place of disposal, the most common practice in Bangladesh was to put/rinse a child's faeces into a toilet or latrine. This practice, considered to be safe, was observed for 33.3 per cent of children aged 0–2 years. The other disposal method of child using the toilet/latrine, had limited practice in, at only 5.4 per cent.

Table WS.8: Disposal of child's faeces

Per cent distribution of children age 0-2 years according to place of disposal of child's faeces, and the percentage of children age 0-2 years whose stools were disposed of safely the last time the child passed stools, Bangladesh, 2012-2013

		Place of disposal of child's faeces								Total	Percentage of children whose last stools were disposed of safely [1]	Number of childre age 0-2 years
		Child used toilet / latrine	Put / Rinsed into drain or ditch	Thrown into garbage (solid waste)	Thrown into garbage (solid waste)	Buried	Left in the open	Other	Missing /DK			
Total		**5.4**	**33.3**	**19.8**	**13.8**	**0.6**	**19.1**	**7.1**	**1.0**	**100.0**	**38.7**	**12,251**
Type of sanitation facility used by household members	Improved	5.9	38.0	20.0	12.4	0.5	15.3	6.8	1.1	100.0	43.9	9,160
	Unimproved	4.2	22.5	20.2	16.3	0.5	27.0	8.4	0.8	100.0	26.8	2,604
	Open defecation	0.7	2.1	15.3	27.0	1.3	46.7	6.7	0.1	100.0	2.9	487
Division	Barisal	7.5	31.8	11.8	6.6	0.7	35.4	5.4	0.8	100.0	39.3	728
	Chittagong	6.4	31.2	21.3	16.7	0.3	13.0	9.6	1.4	100.0	37.6	2,862
	Dhaka	4.7	41.2	18.8	6.5	0.4	19.6	7.8	0.9	100.0	46.0	3,838
	Khulna	8.4	35.4	24.7	17.1	1.0	10.7	2.2	0.5	100.0	43.8	1,170
	Rajshahi	5.1	29.6	24.8	16.9	0.4	14.1	7.8	1.2	100.0	34.6	1,384
	Rangpur	1.8	19.6	13.7	19.5	1.1	38.9	4.9	0.5	100.0	21.4	1,334
	Sylhet	4.6	31.0	21.0	23.3	0.6	12.1	6.6	0.8	100.0	35.5	935
Area	Urban	7.4	52.9	14.1	7.0	0.3	9.1	8.2	1.0	100.0	60.2	2,529
	Rural	4.8	28.2	21.3	15.6	0.6	21.6	6.8	1.0	100.0	33.1	9,722
Mother's education	None	4.3	19.9	22.6	17.0	0.4	28.7	6.3	0.8	100.0	24.2	2,428
	Primary incomplete	4.1	24.0	21.9	15.0	0.6	22.4	10.2	1.8	100.0	28.1	1,660
	Primary complete	4.0	29.5	22.3	15.7	0.8	21.3	5.9	0.4	100.0	33.5	1,911
	Secondary incomplete	5.9	36.2	19.4	13.2	0.6	16.4	7.4	0.9	100.0	42.1	4,536
	Secondary complete or higher	8.0	57.9	12.3	7.3	0.5	6.9	5.9	1.2	100.0	66.0	1,716
Wealth index quintile	Poorest	3.3	16.3	19.8	18.1	0.7	33.0	8.1	0.7	100.0	19.6	2,876
	Second	3.5	20.6	23.1	17.3	0.8	26.5	7.0	1.3	100.0	24.1	2,471
	Middle	5.1	26.6	25.7	15.7	0.7	18.8	6.4	1.0	100.0	31.7	2,289
	Fourth	6.6	43.2	20.6	11.3	0.4	10.7	6.2	1.1	100.0	49.8	2,238
	Richest	8.8	64.3	10.1	5.5	0.2	2.8	7.5	0.8	100.0	73.1	2,377

[1] MICS indicator 4.4 - Safe disposal of child's faeces

Handwashing

Handwashing with water and soap is the most cost effective health intervention to reduce both the incidence of diarrhoea and pneumonia in children under five[32]. It is most effective when done using water and soap after visiting a toilet or cleaning a child, before eating or handling food and, before feeding a child. Monitoring correct handwashing behaviour at these critical times is challenging. A reliable alternative to observations or self-reported behaviour is assessing the likelihood that correct handwashing behaviour takes place by observing if a household has a specific place where people most often wash their hands and observing if water and soap (or other local cleansing materials) are present at a specific place for handwashing[33].

[32] *Cairncross, S. Valdmanis V. 2006. Water supply, sanitation and hygiene promotion. Chapter 41. In 'Disease Control Priorities in Developing Countries'. Second Edition. Edt. Jameson et al 2006. The World Bank. Washington DC: National Institutes of Health.*

[33] *Ram P, Halder A, Granger S, Hall P, Jones T, Hitchcock D, Nygren B, Islam M, Molyneaux J, Luby S, editors. Use of a novel method to detect reactivity to structured observation for measurement of handwashing behavior. American Society of Tropical Medicine and Hygiene; 2008; New Orleans, LA.*

Table WS.9: Water and soap at place for handwashing

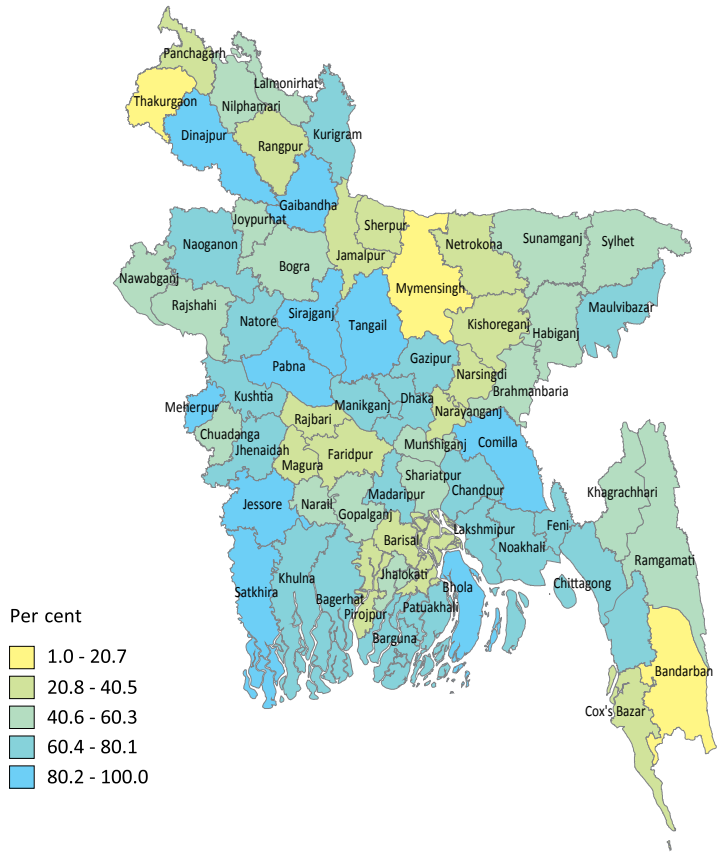
Percentage of households where place for handwashing was observed and per cent distribution of households by availability of water and soap at place for handwashing, Bangladesh, 2012-2013

		Percentage of households: where place for handwashing was observed	Percentage of households: With no specific place for handwashing in the dwelling, yard, or plot	Number of households	Percentage of households where place for handwashing was not observed				Total	Per cent distribution of households where place for handwashing was observed, where:					Total	Number of households where place for handwashing was observed
					Not in dwelling/ plot/yard	No permission to see	Other reasons	Missing		Water and soap are available [1]	Water is available, soap is not available	Water is not available, soap is available	Water and soap are not available	Missing		
Total		**82.0**	**17.0**	**51,895**	**17.0**	**0.3**	**0.6**	**0.0**	**100.0**	**59.1**	**35.0**	**1.5**	**4.3**	**0.1**	**100.0**	**42,572**
Division	Barisal	95.5	3.9	3,155	3.9	0.0	0.6	0.0	100.0	50.0	41.8	2.8	5.3	0.1	100.0	3,013
	Chittagong	65.7	32.1	9,278	32.1	0.6	1.6	0.0	100.0	71.4	24.1	1.4	2.9	0.2	100.0	6,097
	Dhaka	90.5	8.2	16,556	8.2	0.6	0.7	0.0	100.0	50.1	47.7	0.3	1.9	0.0	100.0	14,985
	Khulna	65.5	34.4	6,167	34.4	0.1	0.0	0.0	100.0	66.5	28.9	4.1	0.5	0.1	100.0	4,040
	Rajshahi	80.0	19.7	7,449	19.7	0.0	0.2	0.0	100.0	67.9	25.7	3.6	2.7	0.1	100.0	5,961
	Rangpur	98.0	1.7	6,454	1.7	0.0	0.4	0.0	100.0	61.5	25.1	0.8	12.6	0.0	100.0	6,322
	Sylhet	75.9	23.3	2,836	23.3	0.2	0.5	0.1	100.0	54.2	34.6	0.6	10.6	0.0	100.0	2,153
Area	Urban	86.1	12.5	11,144	12.5	1.2	0.3	0.0	100.0	70.3	26.4	0.8	2.3	0.1	100.0	9,591
	Rural	80.9	18.2	40,751	18.2	0.1	0.7	0.0	100.0	55.8	37.5	1.7	4.8	0.1	100.0	32,981
Education of ousehold head	None	79.1	19.9	21,823	19.9	0.2	0.7	0.0	100.0	50.5	42.4	1.7	5.4	0.1	100.0	17,267
	Primary incomplete	76.7	22.2	6,776	22.2	0.2	0.9	0.0	100.0	55.5	38.6	1.6	4.2	0.1	100.0	5,199
	Primary complete	85.3	14.0	6,053	14.0	0.1	0.7	0.0	100.0	56.1	38.0	1.3	4.6	0.1	100.0	5,163
	Secondary incomplete	84.2	15.0	8,938	15.0	0.3	0.5	0.0	100.0	63.0	31.4	1.7	3.8	0.1	100.0	7,529
	Secondary complete or higher	89.3	9.3	8,271	9.3	1.1	0.3	0.0	100.0	80.1	16.8	1.1	2.0	0.1	100.0	7,382
	Missing/DK	(91.6)	(6.8)	34	(6.8)	(0.0)	(1.6)	(0.0)	100.0	(32.5)	(60.1)	(0.0)	(7.4)	(0.0)	(100.0)	31
Wealth index quintile	Poorest	70.8	28.1	11,195	28.1	0.1	1.0	0.0	100.0	38.9	46.3	3.4	11.3	0.1	100.0	7,923
	Second	79.7	19.3	10,510	19.3	0.1	0.9	0.0	100.0	49.8	43.4	1.7	5.0	0.0	100.0	8,381
	Middle	83.6	15.7	10,163	15.7	0.1	0.6	0.0	100.0	54.7	40.6	1.5	3.2	0.1	100.0	8,492
	Fourth	86.4	12.8	9,950	12.8	0.3	0.5	0.0	100.0	64.2	33.0	0.9	1.9	0.1	100.0	8,599
	Richest	91.1	7.7	10,078	7.7	1.0	0.2	0.0	100.0	84.3	14.5	0.4	0.7	0.0	100.0	9,177

[1] MICS indicator 4.5 - Place for handwashing

( ) Figures that are based on 25-49 unweighted cases

Map WS.2: Water and soap at place for handwashing by district, Bangladesh, 2012-2013



In Bangladesh, in 82 per cent of the households a specific place for handwashing was observed while 17 per cent households could not indicate a specific place where household members usually wash their hands and 1 per cent of the households either did not give a permission to see the place used for handwashing or it could not be observed for other reasons (Table WS.9). Among household where a place for handwashing was observed almost three in five (59.1 per cent) had both water and soap (or other cleansing agent) present at the specific place and another 35 per cent had only water available. In 35 per cent of the households only water was available at the specific place, while in about 2 per cent of the households the place only had soap but no water. The remaining about 4 per cent of households had neither water nor soap available at the specific place for handwashing

The observation of place of handwashing varies greatly by divisions; some are high - 98 and 95.5 per cent in Rangpur and Barisal, but others are low - 65.7 and 65.5 per cent in Chittagong and Khulna. The availability of proper handwashing facility (water and soap) is correlated with living standard of the household and education of the household head: the richest household are more than twice as likely to have handwashing facility as the poorest household. This is largely attributable to the lack of availability of soap in the poorer households. There are also difference in the availability of soap between urban and rural areas (26.4 versus 37.5 per cent) as also by different divisions – ranging from 24.1 per cent in Chittagong to 47.7 per cent in Dhaka.

Overall, 94 per cent of households in Bangladesh had soap available somewhere in the dwelling (Table WS.10). Among the households where the place of handwashing could be observed, soap was either observed or shown in about 96 per cent cases. In such cases, about 4 per cent were not able or refused to show any soap present in the household. Among the households where the place of handwashing could not be observed, 14.7 per cent were not able or refused to show any soap present in the household. A household belonging to the poorest wealth class was less likely to have soap anywhere in the household (85.7 per cent).

Table WS.10: Availability of soap

Per cent distribution of households by availability of soap in the dwelling, Bangladesh, 2012-2013

		Place for handwashing observed						Place for handwashing not observed					Percentage of households with soap anywhere in the dwelling [1]	Number of households
		Soap observed	Soap shown	No soap in household	Not able/ Does not want to show soap	Missing	Total	Soap shown	No soap in household	Not able/Does not want to show soap	Missing	Total		
Total		**60.6**	**35.3**	**3.6**	**0.3**	**0.1**	**100.0**	**85.2**	**14.3**	**0.4**	**0.1**	**100.0**	**94.0**	**51,895**
Division	Barisal	52.8	42.4	4.5	0.2	0.1	100.0	88.2	11.8	0.0	0.0	100.0	94.9	3,155
	Chittagong	72.9	23.8	3.0	0.1	0.2	100.0	86.2	13.5	0.2	0.0	100.0	93.1	9,278
	Dhaka	50.4	44.8	4.4	0.3	0.1	100.0	80.4	19.3	0.4	0.0	100.0	93.8	16,556
	Khulna	70.6	27.7	1.5	0.1	0.1	100.0	89.5	10.0	0.3	0.1	100.0	95.3	6,167
	Rajshahi	71.5	25.0	3.2	0.1	0.1	100.0	81.5	17.3	0.9	0.3	100.0	93.5	7,449
	Rangpur	62.3	34.1	3.0	0.5	0.1	100.0	60.0	35.2	4.8	0.0	100.0	95.6	6,454
	Sylhet	54.8	38.6	6.0	0.6	0.0	100.0	89.9	10.1	0.0	0.0	100.0	92.5	2,836
Area	Urban	71.2	26.0	2.5	0.2	0.2	100.0	84.7	14.9	0.4	0.0	100.0	95.4	11,144
	Rural	57.6	38.1	4.0	0.3	0.1	100.0	85.3	14.2	0.4	0.1	100.0	93.7	40,751
Education of household head	None	52.1	41.4	5.9	0.4	0.1	100.0	80.6	18.8	0.5	0.1	100.0	90.8	21,823
	Primary incomplete	57.1	39.4	2.9	0.4	0.1	100.0	85.4	14.3	0.2	0.1	100.0	93.9	6,776
	Primary complete	57.4	39.1	3.2	0.2	0.1	100.0	89.8	9.5	0.7	0.0	100.0	95.4	6,053
	Secondary incomplete	64.7	33.1	1.8	0.2	0.2	100.0	90.8	8.8	0.3	0.1	100.0	96.7	8,938
	Secondary complete or higher	81.2	17.9	0.8	0.1	0.1	100.0	94.5	5.2	0.3	0.0	100.0	98.6	8,271
	Missing/DK	(32.5)	(63.6)	(3.8)	(0.0)	(0.0)	100.0	(100.0)	(0.0)	(0.0)	(0.0)	100.0	(96.5)	34
Wealth index quintile	Poorest	42.3	46.7	10.3	0.6	0.1	100.0	77.5	21.9	0.6	0.0	100.0	85.7	11,195
	Second	51.5	43.8	4.1	0.4	0.2	100.0	85.9	13.6	0.3	0.2	100.0	93.4	10,510
	Middle	56.1	40.5	3.0	0.3	0.1	100.0	89.0	10.2	0.7	0.1	100.0	95.4	10,163
	Fourth	65.0	33.5	1.2	0.1	0.1	100.0	91.6	8.3	0.1	0.1	100.0	97.6	9,950
	Richest	84.7	14.8	0.3	0.0	0.1	100.0	94.7	4.9	0.4	0.0	100.0	99.1	10,078

[1] MICS indicator 4.6 - Availability of soap or other cleansing agent

( ) Figures that are based on 25-49 unweighted cases

Drinking Water Quality

Safe drinking water is a human right and a basic requirement for good health. Microbiological contamination of drinking water can lead to diarrhoeal diseases including shigellosis and cholera. Other pathogens in drinking water can cause hepatitis, typhoid, and polio myelitis. Drinking water can also be contaminated with chemicals with harmful effects on human health. Naturally occurring chemicals, especially arsenic and fluoride, have the potential to affect large numbers of people.

The MDG Target 7C is to reduce by half, between 1990 and 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation. *A World Fit for Children* calls for a reduction in the proportion of households without access to hygienic sanitation facilities and affordable and safe drinking water by at least one-third.

The global indicator for tracking progress towards the MDG drinking water target is use of an 'improved source' of drinking water. However, improved sources may be contaminated and provide unsafe water, or safe water may be contaminated during collection, transport and storage at the household. The Bangladesh MICS 2012-2013 is the first nationally representative survey to include measurement of microbiological and chemical quality of drinking water at both the source and the household level.

Arsenic

Arsenic is a known human carcinogen, which was discovered in groundwater in Bangladesh in the 1990s. The WHO provisional guideline value for arsenic since 1993 is 10 parts per billion (ppb), and the same value has been adopted as a standard by the United States Environment Protection Agency (EPA) and the European Union amongst others. The Bangladesh standard for arsenic in drinking water is 50 ppb. The same value applies in India and some other severely arsenic affected countries; 50 ppb was the WHO provisional guideline value for drinking water up to 1993. Some groundwater in Bangladesh is highly contaminated. A non-statutory level of 200 ppb is used in this report to characterize high levels of health risk. Reference table WQ.A provides the critical water quality definitions and references to arsenic concentration in ppb.

Arsenic was measured in the MICS 2012-2013 using the Arsenic Econo-Quick™ Test Kit (Industrial Test Systems, USA), which yields a semi-quantitative measure of arsenic in drinking water. Test chemicals are added to a 50 ml water sample, results are estimated after 12 minutes by comparing the colour on the test strip to a reference chart, and recorded as 0, 10, 25, 50, 100, 200, 300, 500 or 1000 ppb arsenic. During the survey, a subset of five households was randomly chosen to test household drinking water from among the 20 households that were randomly selected from each selected cluster. Household respondents were asked to provide "a glass of water which you would give a child to drink" for testing. Water was also tested at the source for one out of five of the households selected for water quality testing.

During field work, mobile teams of laboratory technicians visited all of the MICS field teams to monitor testing procedures, and to validate field test kit results. A subset of field samples from 438 households were cross-checked in a laboratory using atomic absorption spectrophotometry, and a larger subset of duplicate samples[34] were collected and used for further analysis and comparison with the field test results. With few exceptions, the correlation between field and laboratory results was good, and field test results were slightly adjusted to match laboratory measurements.

Table WQ.A: Description of reference arsenic concentrations

Arsenic Concentration In ppb	Description of significance
<=10	WHO provisional guideline value for arsenic in drinking water since 1993. The same value has been adopted as a standard by the US EPA and the European Union amongst others
<=50	The Bangladesh Standard for arsenic in drinking water. The same value applies in India and some other severely arsenic affected countries. This was the WHO guideline value for arsenic in drinking water up to 1993.
>=200	A non-statutory descriptive statistic, used here to characterize high levels of health risk.

[34] *At each household and source where both arsenic and E. coli testing were done using field test kits, a 125 ml bottle was filled with sample water, acidified, labelled, and stored at UNICEF for future laboratory analysis as and when needed.*

The distribution of the households by arsenic level in source water is shown in Table WQ.1. The corresponding arsenic levels in household drinking water for the survey population are shown in Table WQ.2. Maps giving the spatial distribution of the level of arsenic in source and household water are shown in Map WQ.1 and Map WQ.2.

As shown in Table WQ.2, overall, 24.8 per cent of the population had drinking water in the household with arsenic above the WHO provisional guideline value of <= 10 ppb, and 12.4 per cent of the population exceeded the Bangladesh Standard of <= 50 ppb while 2.8 per cent of the population was exposed to 200 ppb or more. Arsenic contamination was slightly greater at the source (Table WQ.1), with 25.5 per cent exceeding 10 ppb and 12.5 per cent above 50 ppb.

Table WQ.1: Source water quality: Arsenic

Proportion of households by arsenic concentration in source water, Bangladesh 2012-2013

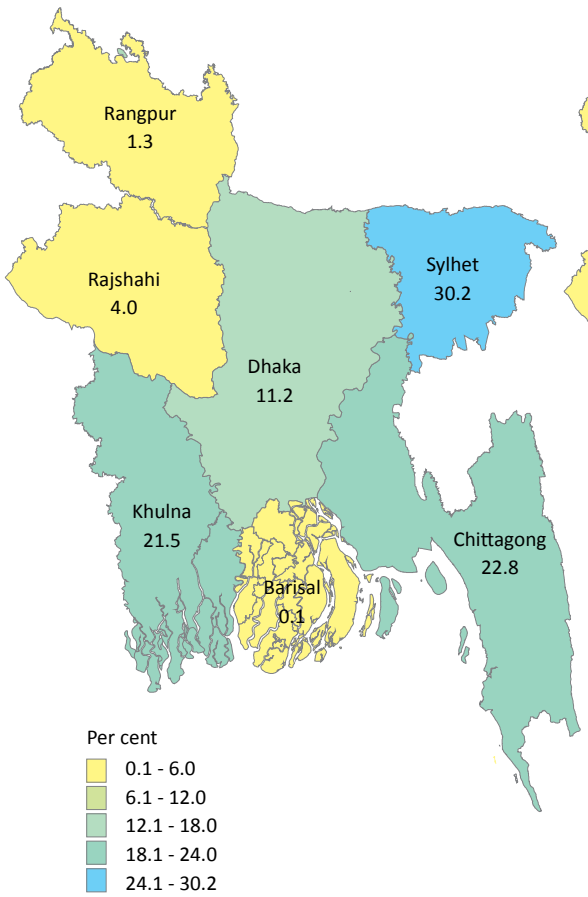
		Proportion of households				Total	Proportion of households using source water containing over 10 ppb Arsenic concentration [2]	Proportion of households using source water containing over 50 ppb Arsenic concentration [1]	Number of households
		Arsenic concentration in source water							
		<=10 ppb (1)	>10 - 50 ppb	>50 - <200 ppb	>=200 ppb				
Total		**74.5**	**13.0**	**10.1**	**2.5**	**100.0**	**25.5**	**12.5**	**2,558**
Division	Barisal	97.2	2.7	0.1	0.0	100.0	2.8	0.1	160
	Chittagong	65.2	12.1	13.9	8.8	100.0	34.8	22.8	457
	Dhaka	70.0	18.8	9.7	1.5	100.0	30.0	11.2	788
	Khulna	60.4	18.0	18.6	3.0	100.0	39.6	21.5	308
	Rajshahi	88.0	7.9	3.9	0.1	100.0	12.0	4.0	376
	Rangpur	92.0	6.8	1.3	0.0	100.0	8.0	1.3	329
	Sylhet	57.5	12.3	29.0	1.2	100.0	42.5	30.2	140
Area	Urban	80.5	12.7	5.5	1.2	100.0	19.5	6.8	531
	Rural	72.9	13.1	11.2	2.8	100.0	27.1	14.0	2,027
Source of drinking water for WQ sample	Unimproved water source	86.1	9.6	3.3	1.0	100.0	13.9	4.3	48
	Improved water source	74.2	13.1	10.2	2.5	100.0	25.8	12.7	2,506
Source of drinking water	Piped water								
	Piped into dwelling	(89.3)	(10.1)	(0.7)	(0.0)	100.0	(10.7)	(0.7)	87
	Piped into compound, yard or plot	89.5	9.8	0.7	0.0	100.0	10.5	0.7	119
	Public tap / standpipe	(88.6)	(7.8)	(3.5)	(0.0)	100.0	(11.4)	(3.5)	31
	Tube well, Borehole	72.6	13.4	11.2	2.8	100.0	27.4	14.0	2,264
	Dug well (protected or unprotected)	(84.7)	(15.4)	(0.0)	(0.0)	100.0	(15.3)	(0.0)	11
	Surface water (river, stream, dam, lake, pond, canal, irrigation channel)	(90.6)	(5.1)	(2.2)	(2.2)	100.0	(9.4)	(4.4)	22
	Other	(83.5)	(11.0)	(5.5)	(0.0)	100.0	(16.5)	(5.5)	20
Education of household head	None	73.6	13.7	10.0	2.7	100.0	26.4	12.7	1,108
	Primary incomplete	75.2	11.8	11.2	1.8	100.0	24.8	13.0	315
	Primary complete	76.7	12.5	9.1	1.7	100.0	23.3	10.8	313
	Secondary incomplete	73.9	12.6	10.9	2.7	100.0	26.1	13.6	454
	Secondary complete or higher	75.4	13.0	8.9	2.7	100.0	24.6	11.6	367
Wealth index quintile	Poorest	75.7	11.9	10.3	2.2	100.0	24.3	12.4	541
	Second	77.4	11.1	9.6	1.8	100.0	22.6	11.4	535
	Middle	71.4	13.7	12.1	2.8	100.0	28.6	14.9	472
	Fourth	71.8	15.2	10.3	2.7	100.0	28.2	13.0	512
	Richest	75.6	13.3	8.2	2.9	100.0	24.4	11.1	499

[1] Country-specific indicator 4.S1a – Arsenic concentration of source water >50 ppb
[2] Country-specific indicator 4.S1b – Arsenic concentration of source water >10 ppb

( ) Figures that are based on 25-49 unweighted cases

Considering the Bangladesh standard, with respect to arsenic found in household water, non-compliance varied regionally from 0.1 per cent in Barisal division to 24.9 per cent in Sylhet division. People living in rural areas are nearly twice as likely to use drinking water containing arsenic above 50 ppb compared to people in urban areas. Improved water sources are much more likely to have arsenic contamination than non-improved sources, since arsenic is mainly found in groundwater and most unimproved sources are surface water. Arsenic contamination did not follow any clear trend with wealth. Tubewells were the most contaminated source (13.8 per cent), just under 2 per cent of households with piped water supplies which are inferred to derive from groundwater, also contained arsenic above the Bangladesh standard. No arsenic contamination was found in protected or unprotected dug wells.

Map WQ.1: Proportion of households by arsenic concentration >50 ppb in source water for drinking by division, Bangladesh, 2012-2013



Map WQ.2: Proportion of population by arsenic concentration >50 ppb in household drinking water by division, Bangladesh, 2012-2013

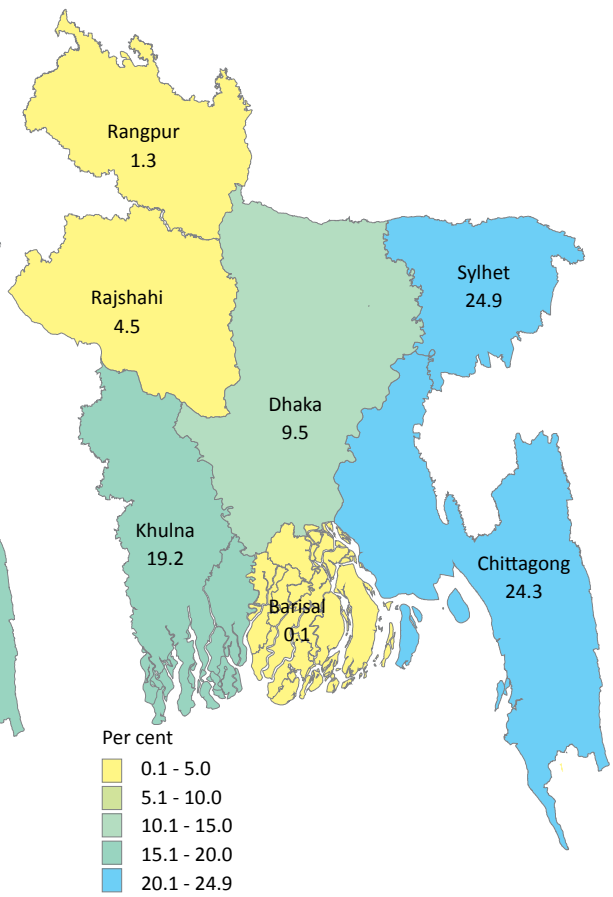


Table WQ.2: Household water quality: Arsenic

Proportion of population by arsenic concentration in drinking water, Bangladesh 2012-2013

		Proportion of population				Total	Proportion of population using drinking water with over 10 ppb Arsenic concentration [2]	Proportion of population using drinking water with over 50 ppb Arsenic concentration [1]	Number of household members
		Arsenic concentration in household drinking water							
		<=10 ppb	>10 - 50 ppb	>50 - <200 ppb	>=200 ppb				
Total		**75.3**	**12.4**	**9.6**	**2.8**	**100.0**	**24.8**	**12.4**	**59,718**
Division	Barisal	94.5	5.4	0.1	0.0	100.0	5.6	0.1	3,787
	Chittagong	63.5	12.3	14.6	9.7	100.0	36.5	24.3	11,942
	Dhaka	74.1	16.4	8.2	1.3	100.0	25.9	9.5	18,439
	Khulna	62.6	18.2	16.6	2.7	100.0	37.4	19.2	6,703
	Rajshahi	88.6	7.0	3.8	0.7	100.0	11.4	4.5	7,787
	Rangpur	92.7	6.0	1.3	0.0	100.0	7.3	1.3	6,994
	Sylhet	62.3	12.8	24.0	0.9	100.0	37.7	24.9	4,067
Area	Urban	80.6	12.2	5.7	1.5	100.0	19.4	7.2	12,230
	Rural	73.9	12.4	10.6	3.1	100.0	26.1	13.7	47,488
Source of drinking water for WQ sample	Unimproved water source	89.4	8.1	1.5	1.1	100.0	10.6	2.6	1,266
	Improved water source	75.0	12.5	9.8	2.8	100.0	25.1	12.6	58,340
Source of drinking water	Piped water								
	Piped into dwelling	91.3	7.1	0.8	0.9	100.0	8.8	1.7	2,229
	Piped into compound, yard or plot	90.1	9.0	0.7	0.2	100.0	9.9	0.9	2,483
	Public tap / standpipe	86.5	10.4	2.9	0.3	100.0	13.5	3.1	644
	Tube well, Borehole	73.4	12.9	10.7	3.1	100.0	26.6	13.8	52,875
	Dug well								
	Protected well	91.3	8.8	0.0	0.0	100.0	8.8	0.0	83
	Unprotected well	80.3	19.7	0.0	0.0	100.0	19.7	0.0	187
	Surface water (river, stream, dam, lake, pond, canal, irrigation channel)	93.0	4.2	1.2	1.7	100.0	7.0	2.9	822
	Other	85.5	11.3	3.2	0.0	100.0	14.5	3.2	283
Education of household head	None	74.2	12.8	10.1	2.9	100.0	25.8	13.0	25,778
	Primary incomplete	71.8	13.7	11.2	3.3	100.0	28.2	14.5	7,720
	Primary complete	78.0	11.2	8.8	2.0	100.0	22.0	10.8	7,056
	Secondary incomplete	75.5	12.0	9.4	3.0	100.0	24.5	12.5	10,151
	Secondary complete or higher	78.9	11.3	7.5	2.4	100.0	21.2	9.9	8,989
Wealth index quintile	Poorest	77.6	11.3	8.9	2.2	100.0	22.5	11.1	11,679
	Second	76.0	12.3	9.3	2.3	100.0	24.0	11.6	11,980
	Middle	72.9	12.8	10.9	3.5	100.0	27.2	14.4	12,161
	Fourth	72.0	13.4	11.3	3.3	100.0	28.0	14.6	12,032
	Richest	78.0	12.0	7.6	2.5	100.0	22.1	10.1	11,865

[1] Country-specific indicator 4.S2a – Arsenic concentration of household drinking water >50 ppb
[2] Country-specific indicator 4.S2b – Arsenic concentration of household drinking water >10 ppb

E. coli

Hundreds of species of protozoa, bacteria, and viruses can cause disease in humans; many of these are transmitted through the faecal-oral pathway. Rather than monitor the presence of individual pathogens, faecal indicators are used to identify contamination. The bacteria species *Escherichia coli (E. coli)* is the most commonly recommended faecal indicator, and many countries including Bangladesh have set a standard that no *E. coli* should be found in a 100 ml sample of drinking water.

E. coli was measured in the field by MICS teams, by filtering 100 ml of sample through a 0.45 micron filter (Millipore Microfil®) which was then placed onto Compact Dry EC growth media plates (Nissui, Japan). A 1 ml sample was also tested from the same source directly onto a second media plate. Incubation was done at ambient temperature, and field teams were given padded sacks for storing media plates close to their bodies in case of cold weather. After 24 hours, the number of blue colonies, signifying the presence of *E. coli* colony forming units (cfu), was recorded.

One household from among the 20 households interviewed per cluster was randomly selected for *E. coli* testing. One sample of household drinking water ("a glass of water that you would give a child to drink") was tested, and a second sample was tested directly at the collection point of the drinking water source used by that household, without sterilization. In the case of piped water, the source water sample was collected directly from the tap. A subset of field samples were cross-checked in a laboratory: within 24 hours of collection laboratory technicians filtered a 100 ml aliquot of the collected drinking water through a Millipore™ membrane filter, placed the filter papers on modified *Escherichia coli* agar media, and incubated the plates at 35°C for two hours and then at 44.5°C for another 22 hours. Laboratory technicians counted red or magenta colonies as *E. coli*. Correlation between field and lab results was good, and no adjustments were made to field test results.

The reference Table WQ.E below gives the critical water quality definitions and references to *E.coli* risk categories as cfu/100 ml.

Table WQ.E: Description of *E. coli* Risk Categories

E. coli [CFU/100 ml]	Risk Level	Priority for Action
<1	Low	None
1 – 10	Medium	Low
11-100	High	Higher
>100	Very High	Urgent

Adapted from WHO drinking water quality guidelines, 4th Ed. (2011), E. coli coliform counts are divided into risk categories based on probability of infection of diarrheal disease. Note, this classification does not take account of the sanitary inspection.

The distribution of the population by *E. coli* level in source waters is shown in Table WQ.3 and Figure WQ.1. The corresponding values for *E. coli* in household drinking water samples are shown in Table WQ.4 and Figure WQ.2. Overall, 41.7 per cent of the population had source water with detectable *E. coli* (Table WQ.3), while it was 61.7 per cent for household samples (Table WQ.4), reflecting contamination occurring between the point of collection and use. The proportion of the population having water containing very high levels of contamination (>100 cfu/100 ml) was 7.4 per cent at the source and 13.5 per cent at the household level.

Regionally, contamination at both the source and the household was highest in Sylhet division and lowest in Barisal, Rajshahi, and Rangpur divisions. People in rural areas were more likely to have source water at low risk of contamination from *E. coli*, but at the household level water was equally contaminated in urban and rural settings, at 62 per cent. Very high levels of *E. coli* (>100 cfu/100 ml) was more common in urban than in rural areas, in both source and household waters.

Table WQ.3: Source water quality: E. coli

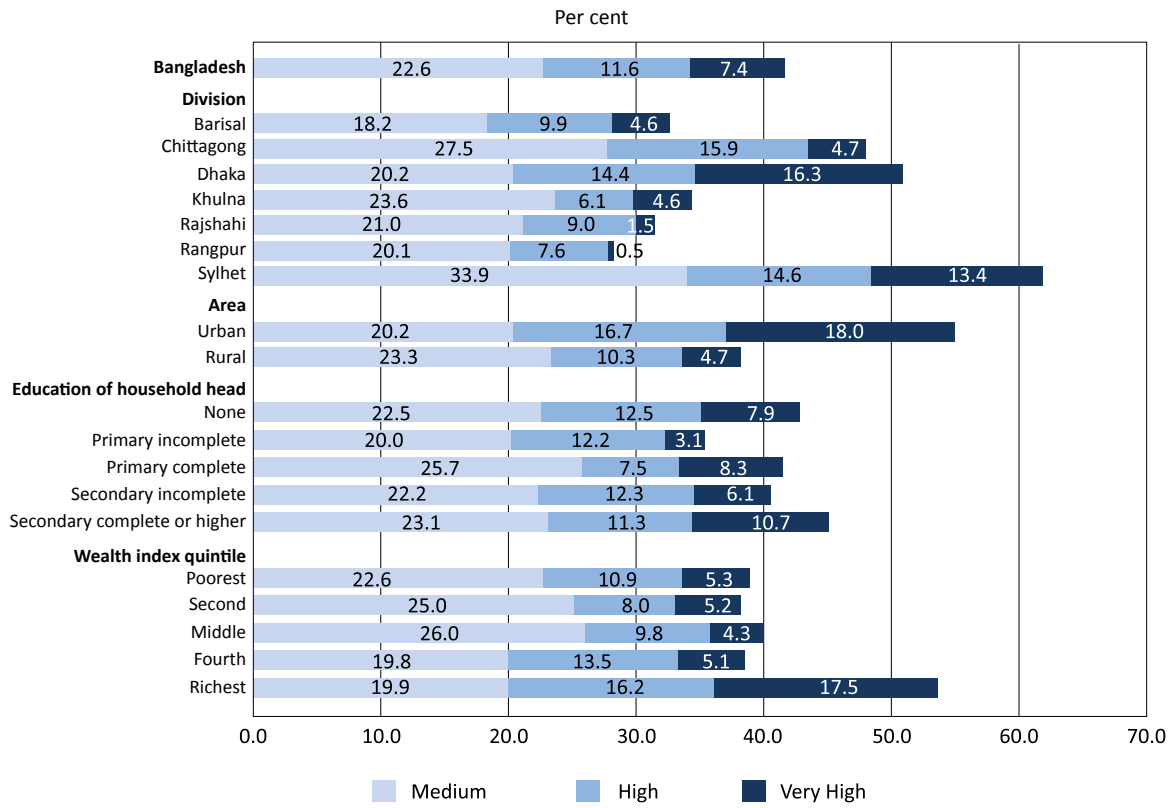
Proportion of households by E. coli risk level in source water, Bangladesh 2012-2013

		Proportion of households				Total	Percentage of households with *E.coli* risk level in source water over 1 cfu/100ml [1]	Number of households
		E. coli risk level in source water						
		Low	Medium	High	Very High			
Total		**58.3**	**22.6**	**11.6**	**7.4**	**100.0**	**41.7**	**2,543**
Division	Barisal	67.3	18.2	9.9	4.6	100.0	32.7	158
	Chittagong	51.9	27.5	15.9	4.7	100.0	48.1	449
	Dhaka	49.1	20.2	14.4	16.3	100.0	50.9	809
	Khulna	65.7	23.6	6.1	4.6	100.0	34.3	298
	Rajshahi	68.6	21.0	9.0	1.5	100.0	31.4	372
	Rangpur	71.8	20.1	7.6	0.5	100.0	28.2	320
	Sylhet	38.1	33.9	14.6	13.4	100.0	61.9	137
Area	Urban	45.0	20.2	16.7	18.0	100.0	55.0	552
	Rural	61.8	23.3	10.3	4.7	100.0	38.2	1,991
Source of drinking water for WQ sample	Unimproved water source	24.6	17.5	22.9	35.0	100.0	75.4	46
	Improved water source	58.9	22.8	11.4	6.9	100.0	41.2	2,492
Source of drinking water	Piped water							
	Piped into dwelling	(19.4)	(18.7)	(15.6)	(46.3)	100.0	(80.6)	100
	Piped into compound, yard or plot	21.5	16.9	21.7	39.9	100.0	78.5	137
	Public tap / standpipe	(71.8)	(9.2)	(15.5)	(3.6)	100.0	(28.2)	31
	Tube well, Borehole	62.3	23.5	10.6	3.6	100.0	37.7	2,219
	Dug well (protected or unprotected)	(8.0)	(23.3)	(36.4)	(32.3)	100.0	(92.0)	11
	Surface water (river, stream, dam, lake, pond, canal, irrigation channel)	(15.2)	(11.2)	(27.6)	(46.0)	100.0	(84.8)	24
	Other	(48.7)	(21.8)	(14.7)	(14.9)	100.0	(51.3)	16
Education of household head	None	57.1	22.5	12.5	7.9	100.0	42.9	1,088
	Primary incomplete	64.7	20.0	12.2	3.1	100.0	35.3	310
	Primary complete	58.4	25.7	7.5	8.3	100.0	41.6	316
	Secondary incomplete	59.4	22.2	12.3	6.1	100.0	40.6	454
	Secondary complete or higher	54.9	23.1	11.3	10.7	100.0	45.1	374
Wealth index quintile	Poorest	61.2	22.6	10.9	5.3	100.0	38.8	538
	Second	61.8	25.0	8.0	5.2	100.0	38.2	527
	Middle	60.0	26.0	9.8	4.3	100.0	40.0	460
	Fourth	61.6	19.8	13.5	5.1	100.0	38.4	501
	Richest	46.4	19.9	16.2	17.5	100.0	53.6	517

[1] Country-specific indicator 4.S3 – E.coli concentration in source water ≥1 cfu/100 ml

( ) Figures that are based on 25-49 unweighted cases

Figure WQ.1: Proportion of households by *E. coli* with medium, high and very high risk level in source water by background characteristics, Bangladesh, 2012-2013



E. coli levels were lower in improved sources than in unimproved sources, in both source and household samples. At the water source, no clear trends could be seen with either education level or wealth quintile, though the richest quintile did have markedly poorer water quality. This may reflect a greater reliance by the wealthy on piped water, which had significantly greater faecal contamination at the source than did tubewell water. Dug wells were the most frequently contaminated source, with only 8 per cent at low risk of *E. coli* at the source, followed by surface water at 15.2 per cent. The number of dug wells sampled was small, so protected and unprotected wells were combined for analysis.

At the household level, more educated or more wealthy people tend to have slightly better water quality. At the household level, water taken from surface water sources was most likely to have some level of contamination (95.8 per cent), but water collected from a compound, yard, or plot tap was most likely to result in very high levels of contamination (37.9 per cent with at least 100 cfu/100 ml).

Table WQ.4: Household water quality: E. coli

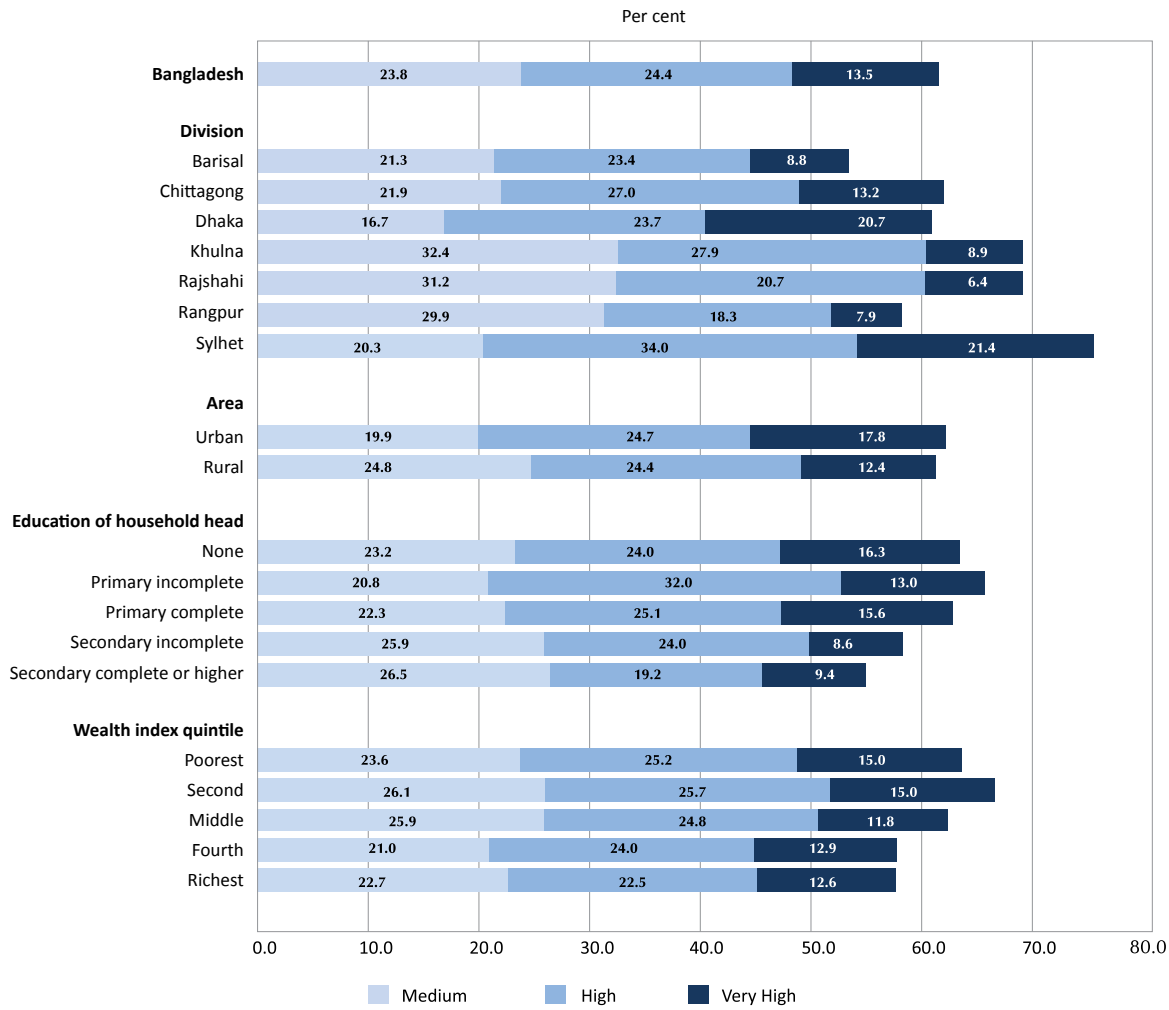
Proportion of population by E. coli risk level in drinking water, Bangladesh 2012-2013

		Proportion of population				Total	Percentage of households members with *E. coli* risk level in household water over 1 cfu/100ml [1]	Number of household members
		E. coli risk level in household drinking water						
		Low	Medium	High	Very High			
Total		**38.3**	**23.8**	**24.4**	**13.5**	**100.0**	**61.7**	**11,854**
Division	Barisal	46.5	21.3	23.4	8.8	100.0	53.5	747
	Chittagong	38.0	21.9	27.0	13.2	100.0	62.0	2,411
	Dhaka	39.0	16.7	23.7	20.7	100.0	61.0	3,570
	Khulna	30.7	32.4	27.9	8.9	100.0	69.3	1,348
	Rajshahi	41.7	31.2	20.7	6.4	100.0	58.3	1,548
	Rangpur	43.9	29.9	18.3	7.9	100.0	56.1	1,440
	Sylhet	24.3	20.3	34.0	21.4	100.0	75.7	790
Area	Urban	37.6	19.9	24.7	17.8	100.0	62.4	2,356
	Rural	38.5	24.8	24.4	12.4	100.0	61.5	9,498
Source of drinking water for WQ sample	Unimproved water source	11.4	25.6	39.0	24.1	100.0	88.7	252
	Improved water source	39.0	23.7	24.1	13.2	100.0	61.0	11,587
Source of drinking water	Piped water							
	Piped into dwelling	(41.3)	(4.3)	(43.3)	(11.1)	100.0	(58.7)	409
	Piped into compound, yard or plot	14.6	16.2	31.3	37.9	100.0	85.4	482
	Public tap / standpipe	(55.7)	(14.2)	(16.4)	(13.8)	100.0	(44.3)	140
	Tube well, Borehole	39.8	25.0	23.2	12.2	100.0	60.3	10,537
	Dug well (protected or unprotected)	(31.6)	(24.7)	(14.6)	(29.2)	100.0	(68.4)	54
	Surface water (river, stream, dam, lake, pond, canal, irrigation channel)	4.2	23.9	48.6	23.3	100.0	95.8	141
	Other	(22.9)	(30.0)	(28.8)	(18.4)	100.0	(77.1)	76
Education of household head	None	36.4	23.2	24.0	16.3	100.0	63.6	5,106
	Primary incomplete	34.2	20.8	32.0	13.0	100.0	65.8	1,414
	Primary complete	37.0	22.3	25.1	15.6	100.0	63.0	1,530
	Secondary incomplete	41.6	25.9	24.0	8.6	100.0	58.4	2,095
	Secondary complete or higher	44.9	26.5	19.2	9.4	100.0	55.1	1,705
Wealth index quintile	Poorest	36.2	23.6	25.2	15.0	100.0	63.8	2,345
	Second	33.3	26.1	25.7	15.0	100.0	66.7	2,424
	Middle	37.5	25.9	24.8	11.8	100.0	62.5	2,180
	Fourth	42.1	21.0	24.0	12.9	100.0	57.9	2,473
	Richest	42.3	22.7	22.5	12.6	100.0	57.7	2,432

[1] Country-specific indicator 4.S4 – E.coli concentration in household drinking water ≥1 cfu/100 ml

( ) Figures that are based on 25-49 unweighted cases

Figure WQ.2: Proportion of population by *E. coli* with medium, high and very high risk level in household drinking water by background characteristics, Bangladesh MICS, 2012-2013



Combined water quality

Arsenic and *E. coli* contamination were measured at the same households, which allows tabulation of the proportion of population having both arsenic and *E. coli* contaminated drinking water. Nationally, 52.3 per cent of households collect water from a source which meets the Bangladesh standard for both arsenic (<=50 ppb) and *E. coli* (<1 cfu/100 ml) (Table WQ.5), but by the point of consumption only 34.6 per cent of the population consumes water meeting both standards (Table WQ.6). The proportion of population with household water failing both standards was 9.1 per cent. The proportion of the population meeting both standards is nearly the same in urban (35.8 per cent) and rural areas (34.3 per cent), is much higher in improved than in unimproved sources, and shows no strong trends with education or wealth. When the stricter WHO guideline value for arsenic is considered, trends are very similar but the proportion of the population accessing water meeting both standards drops to 49.3 per cent and 33.5 per cent at the source and household level, respectively.

Table WQ.5: Source water quality: arsenic and *E. coli*

Proportion of households by levels of arsenic and *E. coli* found in household drinking water, Bangladesh, 2012-2013

		Percentage of households				Total	Number of households
		Arsenic <= 50 ppb and *E. coli* < 1 cfu/100ml	Arsenic <= 50 ppb and *E. coli* ≥ 1 cfu/100ml	Arsenic > 50 ppb and *E. coli* < 1 cfu/100ml	Arsenic > 50 ppb and *E. coli* ≥ 1 cfu/100ml		
Total		**52.3**	**35.0**	**6.0**	**6.7**	**100.0**	**2,365**
Division	Barisal	67.2	32.8	0.0	0.0	100.0	154
	Chittagong	41.7	33.4	10.2	14.8	100.0	425
	Dhaka	44.1	44.6	5.2	6.1	100.0	685
	Khulna	51.7	27.7	13.8	6.8	100.0	291
	Rajshahi	65.0	30.4	3.6	1.1	100.0	369
	Rangpur	71.2	28.3	0.5	0.0	100.0	316
	Sylhet	31.1	38.8	6.0	24.0	100.0	125
Area	Urban	42.1	50.0	3.0	4.9	100.0	489
	Rural	55.0	31.1	6.8	7.1	100.0	1,876
Source of drinking water for WQ sample	Unimproved water source	21.3	73.1	2.0	3.7	100.0	44
	Improved water source	52.8	34.4	6.1	6.8	100.0	2,316
Source of drinking water	Piped water						
	Piped into dwelling	(*)	(*)	(*)	(*)	100.0	83
	Piped into compound, yard or plot	(21.5)	(77.4)	(0.0)	(1.1)	100.0	108
	Public tap / standpipe	(71.8)	(23.0)	(0.0)	(5.3)	100.0	31
	Tube well, Borehole	55.5	30.4	6.7	7.4	100.0	2,090
	Dug well (protected or unprotected)	(5.7)	(94.3)	(0.0)	(0.0)	100.0	10
	Surface water (river, stream, dam, lake, pond, canal, irrigation channel)	(12.9)	(79.9)	(0.0)	(7.2)	100.0	22
	Other	(43.9)	(50.7)	(5.5)	(0.0)	100.0	16
Education of household head	None	51.4	36.1	5.6	6.9	100.0	1,013
	Primary incomplete	58.7	27.9	5.8	7.6	100.0	287
	Primary complete	54.6	33.9	3.6	7.8	100.0	293
	Secondary incomplete	52.6	33.5	6.7	7.2	100.0	427
	Secondary complete or higher	47.2	40.8	8.4	3.7	100.0	345
Wealth index quintile	Poorest	56.3	31.0	4.5	8.2	100.0	509
	Second	56.8	31.2	5.0	6.9	100.0	493
	Middle	52.5	34.0	7.5	6.0	100.0	434
	Fourth	54.4	31.6	7.1	6.9	100.0	470
	Richest	40.7	48.1	6.1	5.1	100.0	459

(*) Figures that are based on less than 25 unweighted cases
( ) Figures that are based on 25-49 unweighted cases

Table WQ.6: Household water quality: arsenic and *E. coli*

Proportion of population by levels of arsenic and *E. coli* found in household drinking water, Bangladesh, 2012-2013

		Percentage of population				Total	Number of household members
		Arsenic <= 50 ppb and *E. coli* < 1 cfu/100ml	Arsenic <= 50 ppb and *E. coli* ≥ 1 cfu/100ml	Arsenic > 50 ppb and *E. coli* < 1 cfu/100ml	Arsenic > 50 ppb and *E. coli* ≥ 1 cfu/100ml		
Total		**34.6**	**52.6**	**3.8**	**9.1**	**100.0**	**11,146**
Division	Barisal	46.5	53.5	0.0	0.0	100.0	738
	Chittagong	29.6	44.0	8.6	17.8	100.0	2,263
	Dhaka	36.3	53.9	2.7	7.2	100.0	3,171
	Khulna	25.4	56.1	5.4	13.2	100.0	1,314
	Rajshahi	38.0	56.7	3.7	1.6	100.0	1,526
	Rangpur	43.6	56.1	0.2	0.2	100.0	1,402
	Sylhet	23.0	50.4	1.3	25.3	100.0	732
Area	Urban	35.8	58.3	1.8	4.1	100.0	2,253
	Rural	34.3	51.1	4.3	10.4	100.0	8,892
Source of drinking water for WQ sample	Unimproved water source	10.0	86.0	1.4	2.6	100.0	250
	Improved water source	35.2	51.8	3.8	9.3	100.0	10,880
Source of drinking water	Piped water						
	Piped into dwelling	(41.3)	(58.7)	(0.0)	(0.0)	100.0	390
	Piped into compound, yard or plot	14.6	83.4	0.0	2.0	100.0	471
	Public tap / standpipe	(53.9)	(42.0)	(1.7)	(2.3)	100.0	139
	Tube well, Borehole	35.6	50.1	4.2	10.1	100.0	9,862
	Dug well (protected or unprotected)	(31.6)	(68.4)	(0.0)	(0.0)	100.0	53
	Surface water (river, stream, dam, lake, pond, canal, irrigation channel)	4.2	91.2	0.0	4.6	100.0	139
	Other	(18.3)	(77.1)	(4.5)	(0.0)	100.0	76
Education of household head	None	34.0	52.9	2.4	10.7	100.0	4,786
	Primary incomplete	29.7	55.0	4.6	10.7	100.0	1,355
	Primary complete	35.8	54.0	1.2	9.0	100.0	1,425
	Secondary incomplete	34.4	52.5	7.1	6.0	100.0	1,976
	Secondary complete or higher	39.7	48.0	5.2	7.1	100.0	1,601
Wealth index quintile	Poorest	33.5	54.2	2.7	9.6	100.0	2,232
	Second	31.1	56.5	2.3	10.1	100.0	2,250
	Middle	33.4	53.3	4.1	9.2	100.0	2,036
	Fourth	37.8	48.0	4.3	9.9	100.0	2,338
	Richest	36.8	51.1	5.4	6.7	100.0	2,289

( ) Figures that are based on 25-49 unweighted cases