

Supplementary Materials for

Estimating the cost of interventions to improve water, sanitation, and hygiene in healthcare facilities across India

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Supplementary Tables

Supplementary Table 1. The number of surveyed public and private healthcare facilities with available cost data

Intervention	All (N = 32)	Public (n = 19)						Private (n = 13)		
		PHC (n = 3)	CHC (n = 3)	DH (n = 4)	MC (n = 3)	Specialty (n = 3)	Tertiary (n = 3)	MC (n = 2)	Specialty (n = 6)	Tertiary (n = 5)
Water-basic	31	3	3	3	3	3	3	2	6	5
Water-advanced	25	3	2	2	2	3	2	2	5	4
Sanitation (toilets)	13	1	0	1	0	0	3	1	3	4
Hand hygiene (sinks)	29	3	3	4	3	2	2	2	6	4
Hand hygiene (non-water-based materials)	30	3	2	4	3	3	3	2	5	5
Linen reprocessing (on-site)	25	2	3	2	3	3	2	2	5	3
Linen reprocessing (off-site/outsourced)	16	2	1	3	2	1	2	0	3	2
Medical device reprocessing	31	3	3	4	3	3	3	1	6	5
Disposable equipment	19	2	2	2	3	3	1	1	3	2
Surface cleaning	31	3	3	4	3	3	3	2	6	4
HAIs	11	0	0	1	0	0	2	1	2	5

Note: CHC = community health center, DH = district hospital, HCF = healthcare facility, MC = medical college, PHC = primary health centers.

† Basic service includes piped potable water, water from a tube well/borehole, or vended water on premise; advanced service includes a water distribution system piped into the facility.

Supplementary Table 2. Capital and recurrent inputs for estimating the cost of WASH interventions and service units

Intervention unit	Service unit	Capital expenditures			Recurrent expenditures	
		Inputs	Data source ^a	Expected life years [Reference]	Inputs	Data source ^a
Basic water service	Improved water source (tubewell/borehole or piped water) on premise	NA	NA	NA	Vended water service and delivery fee	2018-2019 contract
		Drilling rig, fuel, casing, piping, platform, pump, labor, and single maintenance charge for tubewell/borehole	1998-2018 expenditure reports (precise year unknown)	20 [1]	Staff salary for maintenance of tubewell/borehole	2017-2018 expenditure report and stock registers
		Connection to municipal water system for piped water	1998-2018 expenditure reports (precise year unknown)	40 [1]	Municipal or private water service/supply fee for piped water	2017-2018 expenditure report and stock registers
		Pipes, valves, fixtures, installation, and labor for water treatment system	1998-2018 expenditure reports (precise year unknown)	20-50 [2]	Water treatment and testing supplies; staff salary for maintenance, quality monitoring, safety, and protection of water treatment system	2017-2018 expenditure report and stock registers
		Water storage tank(s) and pump(s)	1998-2018 expenditure reports (precise year unknown)	20 [3]	NA	NA
		Septic tank and/or soak pits	1998-2018 expenditure reports (precise year unknown)	30 [1]	Staff salary for maintenance, quality monitoring, safety, and protection of sewage system	2017-2018 expenditure report and stock registers
		Connection to municipal sewage system	1998-2018 expenditure reports (precise year unknown)	40 [1]	Sewage disposal fee	2017-2018 expenditure report and stock registers

Advanced water service	Water distribution system (piped into the facility)	Pipes, valves, fixtures, installation, and labor	1998-2018 expenditure reports (precise year unknown)	50 [4]	Staff salary for maintenance	2017-2018 expenditure report and stock registers
Basic sanitation service	Flush toilet	Flush toilet, installation, plumbing connection, and labor	1998-2018 expenditure reports (precise year unknown)	20 [5]	Staff salary for toilet maintenance/repairs and sewage line maintenance	2017-2018 expenditure report and stock registers
Improved access to hand hygiene services	Handwashing station	Sink, installation, plumbing connection, labor, and 500 mL soap dispenser	1998-2018 expenditure reports (precise year unknown)	20 [Author's estimate]	Antiseptic hand-wash solution/soap (bar, liquid or foam), and staff salary for sink maintenance/repairs	2017-2018 expenditure report and stock registers
Improved access to linen reprocessing services	In-house laundry machines	Washer, hydro-extractor, tumbler, dryer, installation, and labor	1998-2018 expenditure reports (precise year unknown)	12 [6]	Laundry detergent, staff salary for laundry and maintenance, electrical fee	2017-2018 expenditure report and stock registers
Improved access to medical device reprocessing services	Sterilization equipment	Steam autoclave or ethylene oxide (EtO) sterilizer	1998-2018 expenditure reports (precise year unknown)	10 [7]	EtO kit, autoclave kit, high-level disinfectant, and staff salary for reprocessing	2017-2018 expenditure report and stock registers
Improved access to surface cleaning services	Surface cleaning supplies	NA	NA	NA	Detergent, low-level disinfectant, and custodial or other designated staff salary for cleaning environmental surfaces and spills	2017-2018 expenditure report and stock registers

Note: NA = not applicable, WASH = water, sanitation and hygiene.

^a To adjust for inflation, recurrent costs incurred in different years were converted to the base year 2018 using India's consumer price index (CPI) obtained from the World Bank; capital costs could not be adjusted for inflation as data on the year costs were incurred were not collected.

Supplementary Table 3. Healthcare facility characteristics for the Indian public healthcare system

Estimated number	PHC	CHC	DH	MC
Urban HCFs	3,550	775	1,894	206
Rural HCFs	22,193	4,849	0	29
Outpatient departments	1	2	4	12
Licensed beds	5 (4-6)	30 (21-39)	300 (100-500)	800 (150-4,700)
Toilets	6	13	45	124
Handwashing stations	4	13	46	175

Note: CHC = community health center, DH = district hospital, HCF = healthcare facility, MC = medical college, PHC = primary health centers.

Supplementary Table 4. The proportion of healthcare facilities requiring improvements in WASH

	Urban cost (95% CI)				Rural cost (95% CI)			
	PHC	CHC	DH	MC	PHC	CHC	DH	MC
Water-basic	0.31 (0.11-0.49)	0.29 (0.09-0.48)	0.09 (0.02-0.29)	0.09 (0.02-0.29)	0.48 (0.31-0.65)	0.37 (0.20-0.54)	0.30 (0.13-0.47)	0.30 (0.13-0.47)
Water-advanced	0.52 (0.36-0.66)	0.79 (0.52-0.92)	0.19 (0.08-0.31)	0.19 (0.08-0.31)	0.95 (0.87-0.98)	0.64 (0.35-0.85)	0.43 (0.27-0.61)	0.43 (0.27-0.61)
Sanitation (unimproved to basic)	0.26 (0.17-0.33)	0.23 (0.15-0.29)	0.20 (0.13-0.25)	0.20 (0.13-0.25)	0.30 (0.22-0.41)	0.27 (0.20-0.37)	0.26 (0.17-0.33)	0.26 (0.17-0.33)
Sanitation (limited to basic)	0.53 (0.43-0.63)	0.47 (0.32-0.63)	0.37 (0.17-0.57)	0.37 (0.17-0.57)	0.49 (0.40-0.58)	0.46 (0.30-0.62)	0.39 (0.19-0.59)	0.39 (0.19-0.59)
Hand hygiene (unimproved to basic)	0.21 (0.10-0.37)	0.15 (0.05-0.28)	0.10 (0.01-0.19)	0.10 (0.01-0.19)	0.31 (0.21-0.56)	0.26 (0.16-0.51)	0.19 (0.09-0.44)	0.19 (0.09-0.44)
Hand hygiene (limited to basic)	0.22 (0.10-0.42)	0.26 (0.13-0.46)	0.30 (0.16-0.51)	0.30 (0.16-0.51)	0.25 (0.19-0.35)	0.25 (0.19-0.35)	0.25 (0.19-0.35)	0.25 (0.19-0.35)
Linen reprocessing	0.28 (0.13-0.53)	0.25 (0.10-0.50)	0.23 (0.08-0.50)	0.23 (0.08-0.50)	0.33 (0.18-0.58)	0.29 (0.14-0.54)	0.25 (0.10-0.50)	0.25 (0.10-0.50)
Medical device reprocessing	0.60 (0.39-0.78)	0.40 (0.22-0.61)	0.08 (0.01-0.33)	0.08 (0.01-0.33)	0.71 (0.45-0.88)	0.50 (0.27-0.73)	0.35 (0.18-0.57)	0.35 (0.18-0.57)
Surface cleaning	0.79 (0.63-0.91)	0.73 (0.56-0.86)	0.65 (0.52-0.80)	0.65 (0.52-0.80)	0.78 (0.45-0.94)	0.67 (0.35-0.88)	0.65 (0.45-0.85)	0.65 (0.45-0.85)

Note: CHC = community health center, DH = district hospital, PHCs = primary health centers, MC = medical colleges, WASH = water, sanitation and hygiene.

Supplementary Table 5. National costs^a of implementing WASH interventions in primary health centers in India

Intervention	Urban cost (95% CI)		Rural cost (95% CI)		Total cost (95% CI)	
	Million INR	Million USD	Million INR	Million USD	Million INR	Million USD
Water-basic	572 (277-866)	8.36 (4.05-12.66)	5,532 (2,683-8,381)	80.89 (39.23-122.55)	6,104 (2,960-9,247)	89.25 (43.28-135.21)
Water-advanced	401 (329-472)	5.86 (4.82-6.91)	4,580 (3,763-5,396)	66.96 (55.02-78.90)	4,980 (4,093-5,868)	72.83 (59.84-85.81)
Sanitation	666 (544-788)	9.74 (7.96-11.52)	2,458 (1,063-3,853)	35.95 (15.55-56.35)	3,125 (1,608-4,641)	45.69 (23.51-67.87)
Hand hygiene	155 (135-174)	2.26 (1.98-2.54)	1,371 (970-1,773)	20.05 (14.18-25.92)	1,526 (1,105-1,947)	22.31 (16.16-28.46)
Linen reprocessing	446 (222-669)	6.52 (3.24-9.79)	3,283 (1,634-4,933)	48.01 (23.89-72.13)	3,729 (1,855-5,602)	54.52 (27.13-81.92)
Medical device reprocessing	252 (87-416)	3.68 (1.28-6.09)	1,863 (646-3,081)	27.24 (9.44-45.05)	2,115 (733-3,497)	30.93 (10.72-51.14)
Surface cleaning	195 (29-362)	2.86 (0.42-5.30)	1,207 (177-2,236)	17.64 (2.59-32.70)	1,402 (206-2,598)	20.50 (3.01-37.99)
Total	2,686 (1,624-3,748)	39.28 (23.75-54.81)	20,294 (10,936-29,653)	296.75 (159.91-433.59)	22,981 (12,560-33,401)	336.03 (183.65-488.40)

Note: INR = Indian Rupee, USD = United States dollar, WASH = water, sanitation and hygiene.

^a This includes capital and recurrent costs evaluated over a one-year period.

Supplementary Table 6. National costs^a of implementing WASH interventions in community health centers in India

Intervention	Urban cost (95% CI)		Rural cost (95% CI)		Total cost (95% CI)	
	Million INR	Million USD	Million INR	Million USD	Million INR	Million USD
Water-basic	189 (147-231)	2.76 (2.15-3.38)	1,508 (1,172-1,845)	22.06 (17.14-26.97)	1,697 (1,319-2,076)	24.82 (19.29-30.35)
Water-advanced	187 (132-243)	2.74 (1.93-3.55)	837 (472-1,201)	12.23 (6.91-17.56)	1,024 (604-1,444)	14.97 (8.83-21.11)
Sanitation	290 (237-343)	4.24 (3.46-5.02)	1,106 (478-1,733)	16.17 (6.99-25.34)	1,395 (715-2,076)	20.40 (10.46-30.35)
Hand hygiene	99 (87-112)	1.45 (1.27-1.63)	883 (625-1,142)	12.92 (9.13-16.70)	983 (712-1,254)	14.37 (10.41-18.33)
Linen reprocessing	180 (113-248)	2.64 (1.65-3.63)	1,310 (817-1,802)	19.15 (11.95-26.35)	1,490 (930-2,050)	21.79 (13.59-29.98)
Medical device reprocessing	121 (58-183)	1.76 (0.85-2.68)	943 (455-1,432)	13.80 (6.65-20.94)	1,064 (513-1,615)	15.56 (7.50-23.62)
Surface cleaning	177 (132-222)	2.59 (1.93-3.25)	1,018 (758-1,277)	14.88 (11.08-18.68)	1,195 (890-1,500)	17.47 (13.01-21.93)
Total	1,244 (905-1,582)	18.19 (13.24-23.14)	7,605 (4,777-10,432)	111.20 (69.85-152.54)	8,849 (5,683-12,015)	129.39 (83.09-175.68)

Note: INR = Indian Rupee, USD = United States dollar, WASH = water, sanitation and hygiene.

^a This includes capital and recurrent costs evaluated over a one-year period.

Supplementary Table 7. National costs^a of implementing WASH interventions in district hospitals and medical colleges in India

Intervention	Urban cost (95% CI)		Rural cost (95% CI)		Total cost (95% CI)	
	Million INR	Million USD	Million INR	Million USD	Million INR	Million USD
Water-basic	1,150 (899-1,401)	16.82 (13.15-20.48)	93 (83-102)	1.35 (1.21-1.50)	1,243 (982-1,503)	18.17 (14.36-21.98)
Water-advanced	1,227 (546-1,908)	17.94 (7.99-27.89)	24 (20-29)	0.36 (0.30-0.42)	1,251 (566-1,936)	18.30 (8.28-28.31)
Sanitation	2,562 (2,093-3,030)	37.46 (30.61-44.31)	55 (24-87)	0.81 (0.35-1.27)	2,617 (2,117-3,117)	38.27 (30.96-45.58)
Hand hygiene	1,004 (879-1,128)	14.67 (12.85-16.50)	49 (34-63)	0.71 (0.50-0.92)	1,052 (913-1,191)	15.39 (13.35-17.42)
Linen reprocessing	2,407 (1,585-3,228)	35.19 (23.18-47.20)	44 (37-52)	0.65 (0.54-0.76)	2,451 (1,622-3,280)	35.84 (23.72-47.96)
Medical device reprocessing	586 (304-869)	8.57 (4.44-12.70)	35 (29-41)	0.52 (0.43-0.60)	622 (333-910)	9.09 (4.87-13.31)
Surface cleaning	2,784 (2,217-3,351)	40.71 (32.41-49.00)	120 (88-152)	1.76 (1.28-2.23)	2,904 (2,304-3,504)	42.46 (33.70-51.23)
Total	11,719 (8,523-14,915)	171.35 (124.62-218.09)	421 (316-526)	6.15 (4.62-7.69)	12,140 (8,838-15,441)	177.51 (129.24-225.78)

Note: INR = Indian Rupee, MC = medical college, USD = United States dollar, WASH = water, sanitation and hygiene.

^a This includes capital and recurrent costs evaluated over a one-year period.

Supplementary Table 8. National costs^a of implementing WASH interventions across the Indian public healthcare system assuming lower limit estimates of the proportion of HCFs requiring WASH intervention

Intervention	Urban cost (95% CI)		Rural cost (95% CI)		Total cost (95% CI)	
	Million INR	Million USD	Million INR	Million USD	Million INR	Million USD
Water-basic	517 (344-690)	7.56 (5.03-10.09)	4,416 (2,393-6,439)	64.57 (34.99-94.16)	4,933 (2,736-7,130)	72.13 (40.01-104.25)
Water-advanced	917 (545-1,290)	13.41 (7.97-18.86)	4,667 (3,717-5,616)	68.24 (54.35-82.12)	5,584 (4,262-6,906)	81.65 (62.32-100.99)
Sanitation	2,110 (1,724-2,496)	30.86 (25.22-36.50)	2,699 (1,168-4,230)	39.46 (17.07-61.86)	4,809 (2,892-6,727)	70.32 (42.29-98.36)
Hand hygiene	475 (416-534)	6.94 (6.08-7.81)	1,577 (1,115-2,039)	23.06 (16.31-29.82)	2,052 (1,531-2,573)	30.01 (22.39-37.62)
Linen reprocessing	1,116 (699-1,533)	16.32 (10.23-22.41)	2,441 (1,300-3,581)	35.69 (19.02-52.37)	3,557 (2,000-5,114)	52.01 (29.24-74.78)
Medical device reprocessing	303 (127-480)	4.44 (1.85-7.02)	1,709 (670-2,747)	24.98 (9.79-40.17)	2,012 (797-3,227)	29.42 (11.65-47.19)
Surface cleaning	2,519 (1,898-3,140)	36.83 (27.75-45.92)	1,311 (559-2,063)	19.17 (8.17-30.16)	3,830 (2,456-5,203)	56.00 (35.92-76.08)
Total	7,958 (5,752-10,164)	116.37 (84.11-148.62)	18,819 (10,922-26,717)	275.18 (159.70-390.66)	26,777 (16,674-36,880)	391.55 (243.82-539.28)

Note: CI = confidence interval, HCF = healthcare facility, INR = Indian Rupee, USD = United States dollar, WASH = water, sanitation and hygiene.

^aThis includes capital and recurrent costs evaluated over a one-year period.

Supplementary Table 9. National costs^a of implementing WASH interventions across the Indian public healthcare system assuming upper limit estimates of the proportion of HCFs requiring WASH intervention

Intervention	Urban cost (95% CI)		Rural cost (95% CI)		Total cost (95% CI)	
	Million INR	Million USD	Million INR	Million USD	Million INR	Million USD
Water-basic	4,922 (3,578-6,265)	71.96 (52.32-91.61)	9,838 (5,474-14,202)	143.85 (80.04-207.67)	14,760 (9,052-20,467)	215.82 (132.36-299.27)
Water-advanced	2,729 (1,463-3,995)	39.90 (21.39-58.41)	5,870 (4,538-7,202)	85.83 (66.35-105.31)	8,599 (6,001-11,197)	125.73 (87.74-163.72)
Sanitation	4,759 (3,889-5,629)	69.59 (56.86-82.31)	3,962 (1,714-6,210)	57.93 (25.06-90.81)	8,721 (5,603-11,839)	127.52 (81.92-173.12)
Hand hygiene	2,247 (1,967-2,527)	32.86 (28.77-36.95)	2,999 (2,121-3,877)	43.85 (31.01-56.70)	5,246 (4,088-6,404)	76.71 (59.78-93.65)
Linen reprocessing	6,436 (4,091-8,781)	94.11 (59.82-128.40)	8,298 (4,467-12,129)	121.33 (65.32-177.35)	14,734 (8,558-20,910)	215.44 (125.14-305.75)
Medical device reprocessing	2,930 (1,456-4,404)	42.84 (21.28-64.40)	3,744 (1,512-5,977)	54.75 (22.11-87.39)	6,674 (2,967-10,381)	97.59 (43.39-151.79)
Surface cleaning	3,860 (2,917-4,804)	56.45 (42.65-70.24)	2,948 (1,324-4,572)	43.10 (19.36-66.85)	6,808 (4,241-9,376)	99.55 (62.01-137.09)
Total	27,883 (19,360-36,405)	407.70 (283.09-532.32)	37,659 (21,149-54,169)	550.66 (309.25-792.07)	65,542 (40,510-90,574)	958.37 (592.34-1,324.39)

Note: CI = confidence interval, HCF = healthcare facility, INR = Indian Rupee, USD = United States dollar, WASH = water, sanitation and hygiene

^aThis includes capital and recurrent costs evaluated over a one-year period.

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Appendix B

Cost-effectiveness questionnaire for water, sanitation, and hygiene interventions in the Indian public healthcare system.

Part I. General overview

The following questions are about the facility's general infrastructure, the population it serves, and the services provided.

No.	Question	Answer	Remarks/Notes
G1.1	What type of facility is this? <ul style="list-style-type: none"> • Sub-center • Primary health center • Community health center • Sub-district or district hospital • Tertiary hospital • Other (specify) 		
G1.2	Is the facility in a rural or urban setting?		
G1.3	Is the facility a public or private institution?		
G2.1	What population does the facility serve (e.g., pregnant women, newborns, community)?		
G2.2	What is the size of the population, which this facility serves?		

No.	Question	Answer	Remarks/Notes
G2.3	This facility has ___ number of...	_____ Beds _____ Doctors _____ Nurses _____ Other: _____	
G3.1	Does the facility have multiple departments (e.g., OPD, IPD)?		
G3.2	Does the facility have an operation theatre?		
G3.3	Does the facility have specific facilities for deliveries (e.g., delivery suite, labour/delivery room, neonatal room, etc.)? If so, please describe.		
G3.4	Does the facility have specific care units for neonatal care (e.g., NICU, SNCU, nursery)? *NICU = neonatal intensive care unit *SNCU = sick newborn care unit		
G4.1	The facility offers the following outpatient department services (check all that apply): <ul style="list-style-type: none"> <input type="checkbox"/> Maternity <ul style="list-style-type: none"> <input type="checkbox"/> Antenatal <input type="checkbox"/> Delivery including high risk pregnancy? Circle: Yes/No <input type="checkbox"/> Postnatal <input type="checkbox"/> Neonatal <input type="checkbox"/> Nursery <input type="checkbox"/> General Medicine <input type="checkbox"/> Obstetrics <input type="checkbox"/> Gynaecology 		

No.	Question	Answer	Remarks/Notes
	<input type="checkbox"/> Other: _____		
G4.2	<p>The facility has the following inpatient department wards/rooms (check all that apply and provide the number of beds):</p> <input type="checkbox"/> Male medical: ___ beds <input type="checkbox"/> Male surgical: ___ beds <input type="checkbox"/> Female medical: ___ beds <input type="checkbox"/> Female surgical: ___ beds <input type="checkbox"/> Maternity ward: ___ beds <input type="checkbox"/> Labour room: ___ beds <input type="checkbox"/> Neonatal ward: ___ beds <input type="checkbox"/> Neonatal intensive care ward: ___ beds <input type="checkbox"/> Children ward: ___ beds <input type="checkbox"/> Other: _____		
G4.3	<p>The following procedures are available at the facility (check all that apply):</p> <p><u>OPD/IPD procedures:</u></p> <input type="checkbox"/> Bronchoscopy <input type="checkbox"/> Endoscopy <input type="checkbox"/> Dressing (small, medium and large) <input type="checkbox"/> Injection (intramuscular and intravenous) <input type="checkbox"/> Catheterization <input type="checkbox"/> Nebulization <input type="checkbox"/> Douche <input type="checkbox"/> Blood Transfusion <input type="checkbox"/> Hydrotherapy <p><u>Pediatric procedures specifically relating to newborn care:</u></p> <input type="checkbox"/> Incubator		

No.	Question	Answer	Remarks/Notes
	<ul style="list-style-type: none"> <input type="checkbox"/> Gases (oxygen) <input type="checkbox"/> Intubation (endotracheal tube) <input type="checkbox"/> Pulse oximeter <input type="checkbox"/> Lumbar puncture <input type="checkbox"/> Exchange transfusion <input type="checkbox"/> Cut down (venous) <input type="checkbox"/> Plural/ascites tap <input type="checkbox"/> Ventilator <input type="checkbox"/> Live biopsy <input type="checkbox"/> Neonatal resuscitation <input type="checkbox"/> Care of sick new born <input type="checkbox"/> Management of complications through SNCU (Sick Newborn Care Unit) <p><u>Obstetric & Gynecology specialist services:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Forceps delivery <input type="checkbox"/> Craniotomy-dead fetus/hydrocephalus <input type="checkbox"/> Caesarean section <input type="checkbox"/> Suturing perineal tears <input type="checkbox"/> Caesarian hysterectomy <input type="checkbox"/> Ectopic pregnancy ruptured & unruptured <input type="checkbox"/> Retained placenta <input type="checkbox"/> Suturing cervical tear <input type="checkbox"/> Colposcopy 		
G4.4	<p>If a labor ward, neonatal or special newborn care unit exists, which of the following equipment is present in the facility?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Baby incubators <input type="checkbox"/> Neonatal resuscitation kit 		

No.	Question	Answer	Remarks/Notes
	<ul style="list-style-type: none"><input type="checkbox"/> Neonatal laryngoscope<input type="checkbox"/> Newborn care equipment<input type="checkbox"/> Delivery kit<input type="checkbox"/> Episiotomy kit<input type="checkbox"/> Forceps delivery kit<input type="checkbox"/> Nebulizer baby<input type="checkbox"/> CPAP machine<input type="checkbox"/> Weighting machine infant<input type="checkbox"/> BP apparatus & stethoscope<input type="checkbox"/> Infusion pump or syring pump<input type="checkbox"/> Suction machine<input type="checkbox"/> Digital thermometer<input type="checkbox"/> Other: _____ <p>>> Proceed to "Part II. Water Source"</p>		

Part II. Water source

The purpose of the following questions is to determine the main source of water for the healthcare facility, the cost of water provision and infrastructure, and the quality and availability of water.

No.	Question	Remarks/Notes
W1	<p>What is the primary source of water for the facility?</p> <p>Please circle one of the following:</p> <p style="padding-left: 40px;">Piped water into facility^a >> <i>Go to W2.1</i></p> <p style="padding-left: 40px;">Piped water to plot/yard^b >> <i>Go to W2.1</i></p> <p style="padding-left: 40px;">Tubewell or borehole^d >> <i>Go to W3.1</i></p> <p style="padding-left: 40px;">Cart with small tank/drum^e >> <i>Go to W4.1</i></p> <p style="padding-left: 40px;">Tanker-truck^f >> <i>Go to W4.1</i></p> <p style="padding-left: 40px;">Dug well >> <i>Go to W5.1</i></p> <p style="padding-left: 40px;">Public tap or standpipe^c >> <i>Go to W6.1</i></p> <p style="padding-left: 40px;">Other: _____ >> <i>Go to W6.1</i></p> <p><u>Definitions:</u></p> <p>^a Piped water into facility: a water service pipe connected with in-facility plumbing to one or more taps</p> <p>^b Piped water to yard/plot: a piped water connection to a tap placed in the yard or plot outside the facility</p> <p>^c Public tap or standpipe: a public water point from which people can collect water (e.g., a public fountain)</p>	

	<p>^d Tubewell or borehole: a deep hole that has been driven, bored or drilled, to reach groundwater supplies. These are constructed with casing or pipes, which prevent the hole from caving in and protects the water source from run-off water. Water is delivered from a tubewell/borehole through a pump and is protected by a platform around the well to divert spilled water and to protect the well head from runoff water.</p> <p>^e Cart with small tank/drum: water sold by a provider who transports water to the community or facility site</p> <p>^f Tanker-truck: water is trucked into a community or facility site and sold from the water truck.</p>		
W2.1	<p>Is the water service pipe connected to the municipal water system or a private water system?</p> <p><i>If neither, please describe how the water service pipe is connected to the water source.</i></p>		
W2.2	<p>What is the cost of connecting the water service pipe to the water system?</p>		
W2.3	<p>What is the monthly or annual utility fee for water service?</p>		
W2.4	<p>What are the costs associated with installing the water service pipe, water distribution pipes, and pipe fixtures? This includes the cost of labor and materials – e.g., tubing, valves, pressure bladder tank, pressure switch, pipes/fittings, etc.</p> <p>For water piped into the facility, include the cost of any additional equipment and labor needed to connect to the facility's plumbing.</p>		
W2.5	<p>If an operating theatre exists, does it have a piped water supply directly into the department? If so, is there a provision of both cold and hot water?</p>		

	Does this water undergo further treatment? If so, please describe.		
W2.6	If an operating theatre exists, what are the additional costs for supplying water to the operation theatre, treating the water, and providing hot water? >> <i>Go to W7.1</i>		
W3.1	Is the borehole/tubewell located on the facility's premises?		
W3.2	Is the borehole/tubewell in working condition?		
W3.3	What are the costs associated with installing the borehole or tubewell? This includes the following: <ul style="list-style-type: none"> • Cost of renting a drilling rig and purchasing fuel for the rig • Cost of casing/piping (e.g., concrete lining) and platform around the well head • Cost of pump (e.g., hand, electric, etc.) • Cost of labor >> <i>Go to W7.1</i>		
W4.1	Is water sold by a public or private provider?		
W4.2	How does the provider transport the water (e.g., cart with small tank/drum, tanker truck, or other)?		
W4.3	Does the provider transport the water directly to the facility's premises or to a community site?		

W4.4	If transported to a community site, how is the water then transported to the facility, and what are the associated costs including equipment and labor/staff?		
W4.5	How often does the facility purchase water from the provider (e.g., daily, weekly, etc.)?		
W4.6	On average, what is the amount of water the facility purchases from the provider (e.g., daily, weekly, etc.) and what is the cost of purchasing and delivering water? <i>>> Go to W7.1</i>		
W5.1	Is the dugwell located on the premises/in the plot or yard? (Yes/No) <i>>> If no, go to W7.1</i>		
W5.2	What is the cost of constructing the dugwell? This includes the cost of materials (e.g., shovels) and labor.		
W5.3	Is the dugwell protected with a well lining/casing raised above ground level, a platform to divert spilled water, AND a cover to protect the well head from run-off water? <i>>> If no (unprotected), go to W7.1</i>		
W5.4	What is the cost of protecting the dugwell? This includes the cost of materials and labor.		
W6.1	Please describe how water is sourced and transported to the facility.		
W6.2	What is the cost of obtaining and/or transporting water (e.g. materials, labor, etc.)?		

W7.1	<p>Does an overhead water storage tank(s) exist on the premises? (Yes/No)</p> <p>If so, specify the type, size and number of storage units. Examples of storage units include:</p> <ul style="list-style-type: none"> • Jerry cans • Plastic water tank 500-5,000 L • Steel water tank 5,000-10,000 L • Small storage tanks less than 55 (specify size) • Large temporary storage tanks (e.g., bladder tank, onion tank, etc.) <p>>> <i>If no, go to W8.1</i></p>		
W7.2	Is the overhead tank's capacity sufficient? (Yes/No)		
W7.3	What is the cost per unit for the overhead tank?		
W7.4	<p>Does a pump for the overhead tank exist? (Yes/No)</p> <p>>> <i>If no, go to W8.1</i></p>		
W7.5	Is the pump in working condition? (Yes/No)		
W7.6	What is the cost per unit for the pump?		
W8.1	Is water supplied to the facility from a safe source free from fecal/faecal contamination?		
W8.2	Is water supplied to the facility considered low-quality/non-potable or high-quality/potable (e.g., low turbidity and low organic matter)?		

W8.3	Is the quality of the water supplied to the facility monitored regularly, and is there adequate maintenance of water storage and distribution to avoid contamination?		
W8.4	If so, what is the cost of maintaining water safety and protection from decontamination?		
W8.5	If necessary, can water be treated at the facility? >> <i>If no, go to W8.10</i>		
W8.6	If water is treated at the facility, please describe the water treatment process (e.g., sedimentation and/or filtration of turbid water, disinfection with chlorine, etc.).		
W8.7	What are the costs of the treatment process including materials/equipment and installation?		
W8.8	Is the treatment process operated effectively? (Yes/No) Are there sufficient supplies and adequately trained staff? (Yes/No) Is there regular and adequate monitoring of the treatment process and the quality of treated water? (Yes/No)		
W8.9	What are the cost of training/staffing for maintaining operations and monitoring water treatment and quality?		
W8.10	Does water meet WHO guidelines or national standards for safe drinking/potable use? (Yes/No)		
W8.11	If not, is there a safe alternative supply of drinking-water? (Yes/No)		

	<p>If so, please describe.</p> <p>What are the costs of a safe alternative supply of drinking water?</p>		
W8.12	Is the water supply designed and built so that low-quality (non-potable) water used for cleaning, laundry, etc. cannot enter the potable/drinking water supply?		
W9.1	<p>Is there sufficient and reliable potable/drinking water available at all times (round-the-clock) for all needs (e.g., drinking, food preparation, personal hygiene, medical use)?</p> <p><i>If no, please explain.</i></p>		
W9.2	<p>Is there sufficient and reliable water available for non-potable use? (Yes/No)</p> <p><i>If no, please explain.</i></p>		
W9.3	<p>Are there 24 hrs of uninterrupted running water supply?</p> <p><i>If no, approximately how many hours of the day is water supply available?</i></p>		
W10.1	<p>Is there a drainage/sewage system in place for waste water, surface water, and/or subsoil water? (Yes/No)</p> <p><i>If no, describe how wastewater is disposed or managed if at all.</i> <i>>> then proceed to "Part III. Sanitation facilities"</i></p>		
W10.2	If a drainage system exists, is wastewater removed to an off-site sewer? (Yes/No)		

	>> <i>If no, go to W10.7</i>		
W10.3	Is the drainage/sewage pipe connected to the municipal sewage system or a private sewage system? <i>If neither, please describe.</i>		
W10.4	What is the cost of connecting the drainage/sewage pipe to the sewage system?		
W10.5	What is the monthly or annual utility fee for sewage disposal service, if any?		
W10.6	Are there additional costs associated with installing the drainage/sewage pipes? This includes the cost of labor, maintenance, and equipment – e.g., tubing, valves and fixtures.		
W10.7	For on-site wastewater disposal, what type of drainage system is used (e.g., soak-pit)? What are the costs associated with construction and maintenance of the drainage system? >> <i>Proceed to “Part III. Sanitation facilities”</i>		

Part III. Sanitation facilities

The purpose of the following questions is to determine the type of sanitation facilities used by patients and staff at the healthcare facility, and the costs of constructing and maintaining these sanitation facilities.

No.	Question	Remarks/Notes
S1	<p>What type of toilet facility do patients and staff in the facility use?</p> <p>Please circle one of the following:</p> <p>Flush/pour-flush >> <i>Go to S2.1</i></p> <p>Ventilated improved pit latrine (VIP) >> <i>Go to S3.1</i></p> <p>Pit latrine with slab >> <i>Go to S3.1</i></p> <p>Pit latrine without slab/open pit >> <i>Go to S3.1</i></p> <p>Hanging toilet/hanging latrine >> <i>Go to S3.1</i></p> <p>Other: _____ >> <i>Go to S3.1</i></p> <p>No facilities</p> <p>>> <i>If no sanitation facilities exist, proceed to “Part IV. Hand Hygiene”</i></p>	

No.	Question	Answer	Remarks/Notes
S2.1	What type of flush/pour-flush toilet is used in the facility?		
S2.2	How many toilets exist in the facility?		
S2.3	Are toilets in working condition? (Yes/No)		
S2.4	Are toilets separated for men and women AND for patient and staff? (Yes/No)		
S2.5	What is the ratio of toilets to persons in the facility? Does this ratio meet WHO standards of 1 toilet per 20 people? (Yes/No)		
S2.6	What is the cost of installing a single toilet facility including equipment costs and costs of labor?		
S2.7	Where does the flush/pour-flush toilet facility flush to? <ul style="list-style-type: none"> • Piped sewer system (plumbing) • Septic tank • Pit latrine • Other (describe) 		
S2.8	What is the cost of installing the aforementioned sanitary sewer system? This includes cost of labor and equipment for installation.		
S2.9	What are the costs of maintaining working conditions and cleanliness of sanitation facilities? >> <i>Proceed to "Part IV. Hand Hygiene"</i>		
S3.1	Describe the type of toilet facility that is used, and the number of facilities available on the premises.		

S3.2	What are the costs of constructing this type of toilet facility on the premises? This includes the cost of labor and materials.		
S3.3	Is there a sewage disposal system in place? (Yes/No) If so, please describe.		
S3.4	If a sewage disposal system exists, what are the costs of constructing and maintaining this system? >> <i>Proceed to "Part IV. Hand Hygiene"</i>		

Part IV. Hand hygiene

The purpose of the following questions is to determine the type and availability of hand hygiene stations used by patients and staff at the healthcare facility, and the costs of constructing and maintaining hand hygiene stations.

No.	Question	Answer	Remarks/Notes
H1.1	A hand hygiene stations is defined as a basin with water AND soap available. Do hand hygiene stations exist at the facility? (Yes/No) <i>>> If no hand hygiene stations exist, proceed to "Part V. Environmental Cleaning"</i>		
H2.1	Are hand hygiene stations located in the facility or outside the facility?		
H2.2	How are hand hygiene stations constructed? Examples of basins include: <ul style="list-style-type: none"> • Sink/basin with faucet and drain • Bucket with lid, spigot, metal frame, and basin • Other (describe) 		
H2.3	Are the hand hygiene station(s) connected to the facility's plumbing/drainage system? (Yes/No)		
H2.4	Are hand hygiene stations in working condition? (Yes/No)		
H2.5	In what form is soap/handwashing detergent available (e.g., bar, liquid or foam)?		
H2.6	If a soap bottle dispenser or wall dispenser exists, provide the size/volume and number of dispensers available.		

No.	Question	Answer	Remarks/Notes
H3.1	<p>What are the costs of constructing a single hand hygiene station?</p> <p>This should include the cost of:</p> <ul style="list-style-type: none"> • Installation (labor and equipment) • Sink/basin • Connecting to the drainage/plumbing system if applicable • Soap • Soap dispensers if applicable 		
H3.2	Is there a hand hygiene station available within 5 meters of each toilet facility?		
H3.3	<p>Point of care is defined as any location where care or treatment is delivered to a patient from a health care worker.</p> <p>Is there a hand hygiene station available at all points of care? (Yes/No)</p>		
H3.4	If inpatient wards exist, what is the ratio of hand hygiene stations to beds?		
H3.5	If inpatient wards exist, are there at least 2 hand hygiene stations in wards with 20 or more beds?		
H3.6	<p>Are there additional hand hygiene materials available at points of care or toilet facilities? If so, please describe the materials and where they are located in the facility (e.g., high-traffic areas, bedside, personal carriage, etc.).</p> <p>Examples of additional materials are:</p>		

No.	Question	Answer	Remarks/Notes
	<ul style="list-style-type: none"> • Antiseptic/Alcohol-based hand-rub (ABHR) • Personal protective equipment gloves • Surgical hand-rub solution • Other (please specify) 		
H3.7	If alcohol-based hand-rub exists, is it purchased from a vender or produced in-house?		
H4.1	<p>If additional hand hygiene materials exist, what are the costs of providing these materials?</p> <p>This should include the itemized cost of:</p> <ul style="list-style-type: none"> • In-house production of ABHR (e.g., supplies and production staff) if applicable • Commercially purchased ABHR • Surgical hand-rub solution • Dispensers for hand-rub solution including type, size/volume, and the number of dispensers • Personal protective equipment gloves <p>>> Proceed to “Part V. Environmental Cleaning”</p>		

Part V. Environmental cleaning

The purpose of the following questions is to determine the methods and levels of environmental cleaning practiced in the healthcare facility, and the costs of maintaining environmental cleanliness.

No.	Question	Answer	Remarks/Notes
E1.1	Are floors dry swept daily? (Yes/No) If so, what is the cost of this activity including equipment (e.g., broom and dustbin) and custodial staff?		
E1.2	Are floors wet mopped daily with detergent? (Yes/No) If so, what is the cost of this activity including equipment (e.g., mop and detergent) and custodial staff?		
E1.3	Are environmental surfaces (e.g., counters, chairs, tables, etc.) cleaned daily? (Yes/No) If so, what is the cost of this activity including equipment (e.g., cloths, surface wipes, disposable napkins, detergent, etc.) and custodial staff?		
E1.4	Are high-touch surfaces and non-critical medical devices (e.g., stethoscope, blood pressure cuff, etc.) cleaned daily with a low-level disinfectant? (Yes/No) If so, what is the cost per unit of low-level disinfectant?		
E2.1	Is laundry outsourced or washed on-site?		

No.	Question	Answer	Remarks/Notes
E2.2	If outsourced, what is the cost per kilogram of laundry services? And are there additional fees for laundry pick-up and delivery?		
E2.3	On average, how many kilograms of laundry are washed (daily, weekly, etc.)?		
E2.4	If washed on-site by hand, what is the cost of equipment (e.g., laundry detergent, wash basins) and laundry staff to perform these functions?		
E2.5	If washed on-site with laundry washer and dryer: <ul style="list-style-type: none"> • What is the cost of laundry detergent? • What is the cost of laundry staff to perform these functions? • What is the cost of a washer, hydroextractor, tumbler, and calendar dryer • What is the cost of installation? • What are the electrical fees for running the equipment? 		
E3.1	How are semi-critical medical devices disinfected (e.g., high-level disinfectant)?		
E3.2	If high-level disinfectant is used, what is the cost of high-level disinfectant solution?		
	How are critical medical devices sterilized? Examples include: <ul style="list-style-type: none"> • Cleaning with soap and water only • Boiling in pot of water 		

No.	Question	Answer	Remarks/Notes
	<ul style="list-style-type: none">• Soaking in high-level disinfectant• Sterilizing with pressure cooker• Sterilizing with steam-pressure autoclave• Other (describe)		
E3.3	What is the cost of sterilization including equipment (e.g., pressure cooker, fuel if non-electric, autoclave, etc.) and staffing?		

E4.2	Are the following disposable medical devices/equipment available?																																																																																															
Check all that apply and provide the cost of each unit item:																																																																																																
<table border="1"> <thead> <tr> <th>Item</th> <th>Cost</th> <th>Unit</th> <th>Quantity</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> Sterile gloves</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Latex surgical gloves</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Drapes</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Gowns</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Masks</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Forceps</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Blades</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Cord clamp</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Dee Lee's mucus trap</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Intravenous catheters (e.g., 24G)</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Tubing</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> IV sets</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Clean birth kits</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Micro drip set with/without burette</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Blood transfusion set</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> 3-way stop cock</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Suction catheter size # 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No.	Question	Answer	Remarks/Notes
	<input type="checkbox"/> Cotton, surgical gauze <input type="checkbox"/> Normal saline, 10% dextrose infusion bottle <input type="checkbox"/> Other _____		

Part VI. Healthcare costs

The purpose of the following questions is to determine the costs of treatment for hospital-acquired infections in the healthcare facility among mothers and neonates. Costs can be reported per case or per inpatient day (should the respondent provide the average hospital length of stay) and when possible, should include the cost of (1) hospitalization, (2) diagnostic tests, and (3) treatment (e.g., drug doses) among other direct medical costs.

No.	Question	Answer	Remarks/Notes
T1.1	What is the average cost per case of treating intrapartum chorioamnionitis after caesarean delivery?		
T1.2	What is the average cost per case of treating postpartum endometritis after caesarean delivery?		
T1.3	What is the average cost per case of treating a surgical site infection resulting from an episiotomy?		
T1.4	What is the average cost per case of treating a surgical site infection resulting from a caesarean section?		

No.	Question	Answer	Remarks/Notes
T1.5	What is the average cost per case of treating a skin and soft tissue infection resulting from a caesarean section?		
T1.6	What is the average cost per case of treating postpartum (or puerperal) sepsis in mothers?		
T2.1	What is the average cost per case of treating neonatal early-onset septicemia?		
T2.2	What is the average cost per case of treating neonatal late-onset septicemia?		
T2.3	What is the average cost per case of treating a bacterial catheter-associated urinary tract infection (CAUTI) in a newborn?		

No.	Question	Answer	Remarks/Notes
T2.4	What is the average cost per case of treating a bacterial bloodstream infection (BSI) in a newborn?		
T2.5	What is the average cost per case of treating ventilator-associated pneumonia (VAP)?		
T2.6	What is the average cost per case of treating hospital-acquired pneumonia (HAP)?		

>> *End of questionnaire.*