

Supplementary material:
Mapping the evidence on environmental health services in healthcare facilities in low- and middle-income countries: A systematic literature inventory of over 4,000 studies

Contents

1. Search strategy for database search update (Supplementary tables 1-3)
2. Tag categories for evidence map of environmental health services in healthcare facilities (Supplementary table 4)

Search strategy for database search update run January 8, 2025

Supplementary table 1. PubMed (National Library of Medicine / National Institutes of Health): January 8, 2025

Search	Query	Number of Results
1	("standard precautions"[tiab] OR "infection control"[tiab] OR "infection prevention"[tiab] OR IPC[tiab] OR "personal protective equipment"[tiab] OR PPE[tiab] OR "splash protection"[tiab] OR "respiratory protection"[tiab] OR mask[tiab] OR masks[tiab] OR glove[tiab] OR gloves[tiab] OR gown[tiab] OR gowns[tiab] OR goggles[tiab] OR "eye protection"[tiab] OR "face shield"[tiab] OR "face shields"[tiab] OR respirator[tiab] OR respirators[tiab] OR water[tiab] OR sanitation[tiab] OR sanitary[tiab] OR plumbing[tiab] OR sewage[tiab] OR sewer*[tiab] OR latrine[tiab] OR latrines[tiab] OR toilet[tiab] OR toilets[tiab] OR hygiene[tiab] OR hygienic[tiab] OR shower[tiab] OR showers[tiab] OR soap[tiab] OR soaps[tiab] OR detergent[tiab] OR detergents[tiab] OR handwashing[tiab] OR "hand washing"[tiab] OR "hand hygiene"[tiab] OR laundry[tiab] OR bedsheet[tiab] OR bedsheets[tiab] OR bedding[tiab] OR linen[tiab] OR linens[tiab] OR waste[tiab] OR wastes[tiab] OR landfill[tiab] OR landfills[tiab] OR dump[tiab] OR dumps[tiab] OR drainage[tiab] OR wastewater[tiab] OR "waste water"[tiab] OR disposal[tiab] OR disinfect*[tiab] OR cleaner[tiab] OR cleaners[tiab] OR cleaning[tiab] OR cleanliness[tiab] OR janitor*[tiab] OR housekeep*[tiab])	1,688,229
2	(healthcare[tiab] OR "health care"[tiab] OR hospital[tiab] OR hospitals[tiab] OR clinic[tiab] OR clinics[tiab] OR "health facility"[tiab] OR "health facilities"[tiab] OR "health center"[tiab] OR "health centers"[tiab] OR healthcenter[tiab] OR healthcenters[tiab] OR healthcentre[tiab] OR healthcentre[tiab] OR "health centre"[tiab] OR "health centres"[tiab] OR "health post"[tiab] OR "health post"[tiab] OR healthpost[tiab] OR healthposts[tiab] OR "health setting"[tiab] OR "health settings"[tiab] OR "medical facility"[tiab] OR "medical facilities"[tiab] OR "medical center"[tiab] OR "medical centers"[tiab] OR "medical centre"[tiab] OR "medical centres"[tiab] OR "medical post"[tiab] OR "medical posts"[tiab] OR "medical setting"[tiab] OR "medical settings"[tiab] OR "delivery facility"[tiab] OR "delivery facilities"[tiab] OR "delivery center"[tiab] OR "delivery centers"[tiab] OR "delivery centre"[tiab] OR "delivery	2,689,559

Search	Query	Number of Results
	centres"[tiab] OR "delivery clinic"[tiab] OR "delivery clinics"[tiab] OR "birth facility"[tiab] OR "birth facilities"[tiab] OR "birth center"[tiab] OR "birth centers"[tiab] OR "birth centre"[tiab] OR "birth centres"[tiab] OR "birth clinic"[tiab] OR "birth clinics"[tiab] OR "maternal facility"[tiab] OR "maternity facility"[tiab] OR "maternal facilities"[tiab] OR "maternity facilities"[tiab] OR "maternal center"[tiab] OR "maternity center"[tiab] OR "maternal centers"[tiab] OR "maternity centers"[tiab] OR "maternal centre"[tiab] OR "maternal centers"[tiab] OR "maternity clinic"[tiab] OR "maternity clinics"[tiab] OR "maternal clinic"[tiab] OR "maternal clinics"[tiab] OR "maternity home"[tiab] OR "maternity homes"[tiab] OR "maternity waiting homes"[tiab] OR "dispensary"[tiab] OR "dispensaries"[tiab])	
3	Afghanistan[tiab] OR Algeria[tiab] OR Angola[tiab] OR Anguilla[tiab] OR Antigua[tiab] OR Barbuda[tiab] OR Argentina[tiab] OR Armenia[tiab] OR Armenian[tiab] OR Aruba[tiab] OR Azerbaijan[tiab] OR Bahamas[tiab] OR Bahrain[tiab] OR Bangladesh[tiab] OR Barbados[tiab] OR Benin[tiab] OR Byelarus[tiab] OR Byelorussian[tiab] OR Belarus[tiab] OR Belorussian[tiab] OR Belorussia[tiab] OR Belize[tiab] OR Bhutan[tiab] OR Bolivia[tiab] OR Botswana[tiab] OR Brazil[tiab] OR Brunei[tiab] OR "Burkina Faso"[tiab] OR "Burkina Fasso"[tiab] OR "Upper Volta"[tiab] OR Burundi[tiab] OR Urundi[tiab] OR Cambodia[tiab] OR "Khmer Republic"[tiab] OR Kampuchea[tiab] OR Cameroon[tiab] OR Cameroons[tiab] OR Cameron[tiab] OR Camerons[tiab] OR "Cape Verde"[tiab] OR "Cayman Islands"[tiab] OR "Central African Republic"[tiab] OR Chad[tiab] OR Chile[tiab] OR China[tiab] OR Colombia[tiab] OR Comoros[tiab] OR "Comoro Islands"[tiab] OR Comores[tiab] OR Mayotte[tiab] OR Congo[tiab] OR Zaire[tiab] OR "Cook Islands"[tiab] OR "Costa Rica"[tiab] OR "Cote d'Ivoire"[tiab] OR "Ivory Coast"[tiab] OR Croatia[tiab] OR Cuba[tiab] OR Cyprus[tiab] OR Djibouti[tiab] OR "French Somaliland"[tiab] OR Dominica[tiab] OR "Dominican Republic"[tiab] OR "East Timor"[tiab] OR "East Timur"[tiab] OR "Timor Leste"[tiab] OR Ecuador[tiab] OR Egypt[tiab] OR "United Arab Republic"[tiab] OR "El Salvador"[tiab] OR Eritrea[tiab] OR Ethiopia[tiab] OR "Falkland Islands"[tiab] OR "Las Malvinas"[tiab] OR Fiji[tiab] OR Gabon[tiab] OR "Gabonese Republic"[tiab] OR Gambia[tiab] OR Gaza[tiab] OR "Georgia Republic"[tiab] OR "Georgian Republic"[tiab] OR Ghana[tiab] OR "Gold Coast"[tiab] OR Greece[tiab] OR Grenada[tiab] OR Guatemala[tiab] OR Guinea[tiab] OR Guam[tiab] OR Guadeloupe[tiab] OR Guiana[tiab] OR Guyana[tiab] OR Haiti[tiab] OR Honduras[tiab] OR "Hong Kong"[tiab] OR India[tiab] OR Maldives[tiab] OR Indonesia[tiab] OR Iran[tiab] OR Iraq[tiab] OR Jamaica[tiab] OR Jordan[tiab] OR Kazakhstan[tiab] OR Kazakh[tiab] OR Kenya[tiab] OR Kiribati[tiab] OR Korea[tiab] OR Kosovo[tiab] OR Kuwait[tiab] OR Kyrgyzstan[tiab] OR Kirghizia[tiab] OR "Kyrgyz Republic"[tiab] OR Kirghiz[tiab] OR Kirgizstan[tiab] OR "Lao PDR"[tiab] OR Laos[tiab] OR Lebanon[tiab] OR Lesotho[tiab] OR Basutoland[tiab] OR Liberia[tiab] OR Libya[tiab] OR	1,819,547

Search	Query	Number of Results
	Macau[tiab] OR Madagascar[tiab] OR "Malagasy Republic"[tiab] OR Maldives[tiab] OR Malaysia[tiab] OR Malaya[tiab] OR Malay[tiab] OR Sabah[tiab] OR Sarawak[tiab] OR Malawi[tiab] OR Nyasaland[tiab] OR Mali[tiab] OR Malta[tiab] OR "Marshall Islands"[tiab] OR Martinique[tiab] OR Mauritania[tiab] OR Mauritius[tiab] OR "Agalega Islands"[tiab] OR Mexico[tiab] OR Micronesia[tiab] OR "Middle East"[tiab] OR Mongolia[tiab] OR Montserrat[tiab] OR Morocco[tiab] OR Ifni[tiab] OR Mozambique[tiab] OR Myanmar[tiab] OR Myanma[tiab] OR Burma[tiab] OR Namibia[tiab] OR Nauru[tiab] OR Nepal[tiab] OR Niui[tiab] OR "Netherlands Antilles"[tiab] OR "New Caledonia"[tiab] OR Nicaragua[tiab] OR Niger[tiab] OR Nigeria[tiab] OR "Northern Mariana Islands"[tiab] OR Oman[tiab] OR Mayotte[tiab] OR Muscat[tiab] OR Pakistan[tiab] OR Palau[tiab] OR Palestine[tiab] OR Panama[tiab] OR Paraguay[tiab] OR Peru[tiab] OR Philippines[tiab] OR Philipines[tiab] OR Phillipines[tiab] OR Phillippines[tiab] OR Polynesia[tiab] OR "Puerto Rico"[tiab] OR Qatar[tiab] OR Reunion[tiab] OR Rwanda[tiab] OR Ruanda[tiab] OR "Saint Kitts"[tiab] OR "St Kitts"[tiab] OR Nevis[tiab] OR "Saint Lucia"[tiab] OR "St Lucia"[tiab] OR "Saint Vincent"[tiab] OR "St Vincent"[tiab] OR Grenadines[tiab] OR Samoa[tiab] OR "Samoa Islands"[tiab] OR "Navigator Island"[tiab] OR "Navigator Islands"[tiab] OR "Sao Tome"[tiab] OR "Saudi Arabia"[tiab] OR Senegal[tiab] OR Serbia[tiab] OR Montenegro[tiab] OR Seychelles[tiab] OR "Sierra Leone"[tiab] OR Singapore[tiab] OR "Sri Lanka"[tiab] OR Ceylon[tiab] OR "Solomon Islands"[tiab] OR Somalia[tiab] OR "South Africa"[tiab] OR Sudan[tiab] OR Suriname[tiab] OR Surinam[tiab] OR Swaziland[tiab] OR Syria[tiab] OR Tajikistan[tiab] OR Tadjhikistan[tiab] OR Tadjikistan[tiab] OR Tadjhik[tiab] OR Tanzania[tiab] OR Thailand[tiab] OR Togo[tiab] OR "Togolese Republic"[tiab] OR Tokelau[tiab] OR Tonga[tiab] OR Trinidad[tiab] OR Tobago[tiab] OR Tunisia[tiab] OR Turkey[tiab] OR Turkmenistan[tiab] OR Turkmen[tiab] OR "Turks Caicos"[tiab] OR "Turks and Caicos"[tiab] OR Tuvalu[tiab] OR Uganda[tiab] OR "United Arab Emirates"[tiab] OR Uruguay[tiab] OR Uzbekistan[tiab] OR Uzbek[tiab] OR Vanuatu[tiab] OR "New Hebrides"[tiab] OR Venezuela[tiab] OR Vietnam[tiab] OR "Viet Nam"[tiab] OR "Virgin Islands"[tiab] OR "West Bank"[tiab] OR Yemen[tiab] OR Yugoslavia[tiab] OR Zambia[tiab] OR Zimbabwe[tiab] OR "developing population"[tiab] OR "developing world"[tiab] OR "less developed countr"[tiab] OR "less developed nation"[tiab] OR "less developed world"[tiab] OR "lesser developed countr"[tiab] OR "lesser developed nation"[tiab] OR "lesser developed world"[tiab] OR "under developed countr"[tiab] OR "under developed nation"[tiab] OR "under developed world"[tiab] OR "underdeveloped countr"[tiab] OR "underdeveloped nation"[tiab] OR "underdeveloped world"[tiab] OR "middle income countr"[tiab] OR "middle income nation"[tiab] OR "middle income population"[tiab] OR "low income countr"[tiab] OR "low income nation"[tiab] OR "low income population"[tiab] OR "lower income countr"[tiab] OR "lower income	

Search	Query	Number of Results
	nation*"[tiab] OR "lower income population*"[tiab] OR "underserved countr*"[tiab] OR "underserved nation*"[tiab] OR "underserved population*"[tiab] OR "under served population*"[tiab] OR "under served nation*"[tiab] OR "under served population*"[tiab] OR "deprived countr*"[tiab] OR "deprived population*"[tiab] OR "high burden countr*"[tiab] OR "high burden nation*"[tiab] OR "countdown countr*"[tiab] OR "countdown nation*"[tiab] OR "poor countr*"[tiab] OR "poor nation*"[tiab] OR "poor population*"[tiab] OR "poor world"[tiab] OR "poorer countr*"[tiab] OR "poorer nation*"[tiab] OR "poorer population*"[tiab] OR "poorer world"[tiab] OR "developing econom*"[tiab] OR "less developed econom*"[tiab] OR "underdeveloped econom*"[tiab] OR "under developed econom*"[tiab] OR "middle income econom*"[tiab] OR "low income econom*"[tiab] OR "lower income econom*"[tiab] OR "low gdp"[tiab] OR "low gnp"[tiab] OR "low gross domestic"[tiab] OR "low gross national"[tiab] OR "lower gdp"[tiab] OR "lower gnp"[tiab] OR "lower gross domestic"[tiab] OR "lower gross national"[tiab] OR lmic[tiab] OR lmics[tiab] OR "third world"[tiab] OR "lami countr*"[tiab] OR "transitional countr*"[tiab] OR "emerging econom*"[tiab] OR "emerging nation*"[tiab]	
4	#1 AND #2 AND #3	23,064
5	#4 AND (2008:2030[pdat])	19,012
6	#5 AND (English[Language])	17,210
Total		18,343

Supplementary table 2. Scopus (Elsevier): January 8, 2025

Search	Query	Number of Results
1	TITLE-ABS ("standard precaution" OR "standard precautions" OR "infection control" OR "infection prevention" OR IPC OR "personal protective equipment" OR PPE OR "splash protection" OR "respiratory protection" OR mask OR masks OR glove OR gloves OR gown OR gowns OR goggles OR "eye protection" OR "face shield" OR "face shields" OR respirator OR respirators OR water OR sanitation OR sanitary OR plumbing OR sewage OR sewer* OR latrine OR latrines OR toilet OR toilets OR hygiene OR hygienic OR shower OR showers OR soap OR soaps OR detergent OR detergents OR handwashing OR "hand washing" OR "hand hygiene" OR laundry OR bedsheet OR bedsheets OR bedding OR linen OR linens OR waste OR wastes OR landfill OR landfills OR dump OR dumps OR drainage OR wastewater OR "waste water" OR disposal OR disinfect* OR cleaners OR cleaning OR cleanliness OR janitor* OR housekeep*)	6,532,831
2	TITLE-ABS (healthcare OR "health care" OR hospital OR hospitals OR clinic OR clinics OR "health facilit*" OR "health center*" OR healthcenter* OR healthcentre* OR "health centre*" OR "health post*")	3,492,583

Search	Query	Number of Results
	OR healthpost* OR "health setting*" OR "medical facilit*" OR "medical center*" OR "medical centre*" OR "medical post*" OR "medical setting*" OR "delivery facilit*" OR "delivery center*" OR "delivery centre*" OR "delivery clinic*" OR "birth facilit*" OR "birth center*" OR "birth centre*" OR "birth clinic*" OR "matern* facilit*" OR "matern* center*" OR "matern* centre*" OR "matern* clinic*" OR dispensary OR dispensaries)	
3	TITLE-ABS (Afghanistan OR Algeria OR Angola OR Anguilla OR Antigua OR Barbuda OR Argentina OR Armenia OR Armenian OR Aruba OR Azerbaijan OR Bahamas OR Bahrain OR Bangladesh OR Barbados OR Benin OR Byelarus OR Byelorussian OR Belarus OR Belorussian OR Belorussia OR Belize OR Bhutan OR Bolivia OR Botswana OR Brazil OR Brunei OR "Burkina Faso" OR "Burkina Fasso" OR "Upper Volta" OR Burundi OR Urundi OR Cambodia OR "Khmer Republic" OR Kampuchea OR Cameroon OR Cameroons OR Cameron OR Camerons OR "Cape Verde" OR "Cayman Islands" OR "Central African Republic" OR Chad OR Chile OR China OR Colombia OR Comoros OR "Comoro Islands" OR Comores OR Mayotte OR Congo OR Zaire OR "Cook Islands" OR "Costa Rica" OR "Cote d'Ivoire" OR "Ivory Coast" OR Croatia OR Cuba OR Cyprus OR Djibouti OR "French Somaliland" OR Dominica OR "Dominican Republic" OR "East Timor" OR "East Timur" OR "Timor Leste" OR Ecuador OR Egypt OR "United Arab Republic" OR "El Salvador" OR Eritrea OR Ethiopia OR "Falkland Islands" OR "Las Malvinas" OR Fiji OR Gabon OR "Gabonese Republic" OR Gambia OR Gaza OR "Georgia Republic" OR "Georgian Republic" OR Ghana OR "Gold Coast" OR Greece OR Grenada OR Guatemala OR Guinea OR Guam OR Guadeloupe OR Guiana OR Guyana OR Haiti OR Honduras OR "Hong Kong" OR India OR Maldives OR Indonesia OR Iran OR Iraq OR Jamaica OR Jordan OR Kazakhstan OR Kazakh OR Kenya OR Kiribati OR Korea OR Kosovo OR Kuwait OR Kyrgyzstan OR Kirghizia OR "Kyrgyz Republic" OR Kirghiz OR Kirgizstan OR "Lao PDR" OR Laos OR Lebanon OR Lesotho OR Basutoland OR Liberia OR Libya OR Macau OR Madagascar OR "Malagasy Republic" OR Maldives OR Malaysia OR Malaya OR Malay OR Sabah OR Sarawak OR Malawi OR Nyasaland OR Mali OR Malta OR "Marshall Islands" OR Martinique OR Mauritania OR Mauritius OR "Agalega Islands" OR Mexico OR Micronesia OR "Middle East" OR Mongolia OR Montserrat OR Morocco OR Ifni OR Mozambique OR Myanmar OR Myanma OR Burma OR Namibia OR Nauru OR Nepal OR Niui OR "Netherlands Antilles" OR "New Caledonia" OR Nicaragua OR Niger OR Nigeria OR "Northern Mariana Islands" OR Oman OR Mayotte OR Muscat OR Pakistan OR Palau OR Palestine OR Panama OR Paraguay OR Peru OR Philippines OR Philipines OR Phillipines OR Phillippines OR Polynesia OR "Puerto Rico" OR Qatar OR Reunion OR Rwanda OR Ruanda OR "Saint Kitts" OR "St Kitts" OR Nevis OR "Saint Lucia" OR "St Lucia" OR "Saint Vincent" OR "St Vincent" OR Grenadines OR Samoa OR "Samoa Islands" OR "Navigator Island" OR "Navigator Islands" OR "Sao Tome" OR "Saudi Arabia" OR Senegal OR	5,882,128

Search	Query	Number of Results
	Serbia OR Montenegro OR Seychelles OR "Sierra Leone" OR Singapore OR "Sri Lanka" OR Ceylon OR "Solomon Islands" OR Somalia OR "South Africa" OR Sudan OR Suriname OR Surinam OR Swaziland OR Syria OR Tajikistan OR Tadjikistan OR Tadjikistan OR Tadjik OR Tanzania OR Thailand OR Togo OR "Togolese Republic" OR Tokelau OR Tonga OR Trinidad OR Tobago OR Tunisia OR Turkey OR Turkmenistan OR Turkmen OR "Turks Caicos" OR "Turks and Caicos" OR Tuvalu OR Uganda OR "United Arab Emirates" OR Uruguay OR Uzbekistan OR Uzbek OR Vanuatu OR "New Hebrides" OR Venezuela OR Vietnam OR "Viet Nam" OR "Virgin Islands" OR "West Bank" OR Yemen OR Yugoslavia OR Zambia OR Zimbabwe OR "developing population*" OR "developing world" OR "less developed countr*" OR "less developed nation*" OR "less developed world" OR "lesser developed countr*" OR "lesser developed nation*" OR "lesser developed world" OR "under developed countr*" OR "under developed nation*" OR "under developed world" OR "underdeveloped countr*" OR "underdeveloped nation*" OR "underdeveloped world" OR "middle income countr*" OR "middle income nation*" OR "middle income population*" OR "low income countr*" OR "low income nation*" OR "low income population*" OR "lower income countr*" OR "lower income nation*" OR "lower income population*" OR "underserved countr*" OR "underserved nation*" OR "underserved population*" OR "under served population*" OR "under served nation*" OR "under served population*" OR "deprived countr*" OR "deprived population*" OR "high burden countr*" OR "high burden nation*" OR "countdown countr*" OR "countdown nation*" OR "poor countr*" OR "poor nation*" OR "poor population*" OR "poor world" OR "poorer countr*" OR "poorer nation*" OR "poorer population*" OR "poorer world" OR "developing econom*" OR "less developed econom*" OR "underdeveloped econom*" OR "under developed econom*" OR "middle income econom*" OR "low income econom*" OR "lower income econom*" OR "low gdp" OR "low gnp" OR "low gross domestic" OR "low gross national" OR "lower gdp" OR "lower gnp" OR "lower gross domestic" OR "lower gross national" OR "lmic" OR "lmics" OR "third world" OR "lami countr*" OR "transitional countr*" OR "emerging econom*" OR "emerging nation*")	
4	#1 AND #2 AND #3	31,949
5	#4 AND (LIMIT-TO (PUBYEAR , 2008) OR LIMIT-TO (PUBYEAR , 2009) OR LIMIT-TO (PUBYEAR , 2010) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2023) OR LIMIT-TO (PUBYEAR , 2024) OR LIMIT-TO (PUBYEAR , 2025))	26,884
6	#5 AND (EXCLUDE (DOCTYPE , "cp") OR EXCLUDE (DOCTYPE , "cr"))	25,896

Search	Query	Number of Results
7	#6 AND (LIMIT-TO (LANGUAGE , "English"))	24,038
Total		24,034*

*Scopus displayed 24,038 but 4 were duplicates resulting in 24,034 exporting.

Supplementary table 3: Global Health (EBSCOhost): January 8, 2025

Search	Query	Number of Results
1	(TI "standard precaution" OR AB "standard precaution") OR (TI "standard precautions" OR AB "standard precautions") OR (TI "infection control" OR AB "infection control") OR (TI "infection prevention" OR AB "infection prevention") OR (TI IPC OR AB IPC) OR (TI "personal protective equipment" OR AB "personal protective equipment") OR (TI PPE OR AB PPE) OR (TI "splash protection" OR AB "splash protection") OR (TI "respiratory protection" OR AB "respiratory protection") OR (TI mask OR AB mask) OR (TI masks OR AB masks) OR (TI glove OR AB glove) OR (TI gloves OR AB gloves) OR (TI gown OR AB gown) OR (TI gowns OR AB gowns) OR (TI goggles OR AB goggles) OR (TI "eye protection" OR AB "eye protection") OR (TI "face shield" OR AB "face shield") OR (TI "face shields" OR AB "face shields") OR (TI respirator* OR AB respirator*) OR (TI water OR AB water) OR (TI sanitation OR AB sanitation) OR (TI sanitary OR AB sanitary) OR (TI plumbing OR AB plumbing) OR (TI sewage OR AB sewage) OR (TI sewer* OR AB sewer*) OR (TI latrine OR AB latrine) OR (TI latrines OR AB latrines) OR (TI toilet OR AB toilet) OR (TI toilets OR AB toilets) OR (TI hygiene OR AB hygiene) OR (TI hygienic OR AB hygienic) OR (TI shower OR AB shower) OR (TI showers OR AB showers) OR (TI soap OR AB soap) OR (TI soaps OR AB soaps) OR (TI detergent OR AB detergent) OR (TI detergents OR AB detergents) OR (TI handwashing OR AB handwashing) OR (TI "hand washing" OR AB "hand washing") OR (TI "hand hygiene" OR AB "hand hygiene") OR (TI laundry OR AB laundry) OR (TI bedsheet OR AB bedsheet) OR (TI bedsheets OR AB bedsheets) OR (TI bedding OR AB bedding) OR (TI linen OR AB linen) OR (TI linens OR AB linens) OR (TI waste OR AB waste) OR (TI wastes OR AB wastes) OR (TI landfill OR AB landfill) OR (TI landfills OR AB landfills) OR (TI dump OR AB dump) OR (TI dumps OR AB dumps) OR (TI drainage OR AB drainage) OR (TI wastewater OR AB wastewater) OR (TI "waste water" OR AB "waste water") OR (TI disposal OR AB disposal) OR (TI disinfect* OR AB disinfect*) OR (TI cleaner OR AB cleaner) OR (TI cleaners OR AB cleaners) OR (TI cleaning OR AB cleaning) OR (TI cleanliness OR AB cleanliness) OR (TI janitor* OR AB janitor*) OR (TI housekeep* OR AB housekeep*)	622,919
2	(TI healthcare OR AB healthcare) OR (TI "health care" OR AB "health care") OR (TI hospital OR AB hospital) OR (TI hospitals OR AB hospitals) OR (TI clinic OR AB clinic) OR (TI clinics OR AB clinics) OR (TI "health facility" OR AB "health facility") OR (TI "health facilities" OR AB "health facilities") OR (TI "health center" OR AB "health center") OR (TI "health centers" OR AB	567,774

Search	Query	Number of Results
	"health centers") OR (TI healthcenter OR AB healthcenter) OR (TI healthcenters OR AB healthcenters) OR (TI healthcentre OR AB healthcentre) OR (TI healthcentres OR AB healthcentres) OR (TI "health centre" OR AB "health centre") OR (TI "health centres" OR AB "health centres") OR (TI "health post" OR AB "health post") OR (TI "health post" OR AB "health post") OR (TI healthpost OR AB healthpost) OR (TI healthposts OR AB healthposts) OR (TI "health setting" OR AB "health setting") OR (TI "health settings" OR AB "health settings") OR (TI "medical facility" OR AB "medical facility") OR (TI "medical facilities" OR AB "medical facilities") OR (TI "medical center" OR AB "medical center") OR (TI "medical centers" OR AB "medical centers") OR (TI "medical centre" OR AB "medical centre") OR (TI "medical centres" OR AB "medical centres") OR (TI "medical post" OR AB "medical post") OR (TI "medical posts" OR AB "medical posts") OR (TI "medical setting" OR AB "medical setting") OR (TI "medical settings" OR AB "medical settings") OR (TI "delivery facility" OR AB "delivery facility") OR (TI "delivery facilities" OR AB "delivery facilities") OR (TI "delivery center" OR AB "delivery center") OR (TI "delivery centers" OR AB "delivery centers") OR (TI "delivery centre" OR AB "delivery centre") OR (TI "delivery centres" OR AB "delivery centres") OR (TI "delivery clinic" OR AB "delivery clinic") OR (TI "delivery clinics" OR AB "delivery clinics") OR (TI "birth facility" OR AB "birth facility") OR (TI "birth facilities" OR AB "birth facilities") OR (TI "birth center" OR AB "birth center") OR (TI "birth centers" OR AB "birth centers") OR (TI "birth centre" OR AB "birth centre") OR (TI "birth centres" OR AB "birth centres") OR (TI "birth clinic" OR AB "birth clinic") OR (TI "birth clinics" OR AB "birth clinics") OR (TI "maternal facility" OR AB "maternal facility") OR (TI "maternity facility" OR AB "maternity facility") OR (TI "maternal facilities" OR AB "maternal facilities") OR (TI "maternity facilities" OR AB "maternity facilities") OR (TI "maternal center" OR AB "maternal center") OR (TI "maternity center" OR AB "maternity center") OR (TI "maternal centers" OR AB "maternal centers") OR (TI "maternity centers" OR AB "maternity centers") OR (TI "maternal centre" OR AB "maternal centre") OR (TI "maternal centers" OR AB "maternal centers") OR (TI "maternity clinic" OR AB "maternity clinic") OR (TI "maternity clinics" OR AB "maternity clinics") OR (TI "maternal clinic" OR AB "maternal clinic") OR (TI "maternal clinics" OR AB "maternal clinics") OR (TI "maternity home" OR AB "maternity home") OR (TI "maternity homes" OR AB "maternity homes") OR (TI "maternity waiting homes" OR AB "maternity waiting homes") OR (TI dispensary OR AB dispensary) OR (TI dispensaries OR AB dispensaries)	
3	(TI Afghanistan OR AB Afghanistan) OR (TI Algeria OR AB Algeria) OR (TI Angola OR AB Angola) OR (TI Anguilla OR AB Anguilla) OR (TI Antigua OR AB Antigua) OR (TI Barbuda OR AB Barbuda) OR (TI Argentina OR AB Argentina) OR (TI Armenia OR AB Armenia) OR (TI Armenian OR AB Armenian) OR (TI Aruba OR AB Aruba) OR (TI Azerbaijan OR AB Azerbaijan) OR (TI Bahamas OR AB Bahamas) OR (TI Bahrain OR AB Bahrain) OR (TI Bangladesh OR AB Bangladesh) OR (TI Barbados OR AB Barbados) OR (TI Benin OR AB Benin)	936,763

Search	Query	Number of Results
	OR (TI Byelarus OR AB Byelarus) OR (TI Byelorussian OR AB Byelorussian) OR (TI Belarus OR AB Belarus) OR (TI Belorussian OR AB Belorussian) OR (TI Belorussia OR AB Belorussia) OR (TI Belize OR AB Belize) OR (TI Bhutan OR AB Bhutan) OR (TI Bolivia OR AB Bolivia) OR (TI Botswana OR AB Botswana) OR (TI Brazil OR AB Brazil) OR (TI Brunei OR AB Brunei) OR (TI "Burkina Faso" OR AB "Burkina Faso") OR (TI "Burkina Fasso" OR AB "Burkina Fasso") OR (TI "Upper Volta" OR AB "Upper Volta") OR (TI Burundi OR AB Burundi) OR (TI Urundi OR AB Urundi) OR (TI Cambodia OR AB Cambodia) OR (TI "Khmer Republic" OR AB "Khmer Republic") OR (TI Kampuchea OR AB Kampuchea) OR (TI Cameroon OR AB Cameroon) OR (TI Cameroons OR AB Cameroons) OR (TI Cameron OR AB Cameron) OR (TI Camerons OR AB Camerons) OR (TI "Cape Verde" OR AB "Cape Verde") OR (TI "Cayman Islands" OR AB "Cayman Islands") OR (TI "Central African Republic" OR AB "Central African Republic") OR (TI Chad OR AB Chad) OR (TI Chile OR AB Chile) OR (TI China OR AB China) OR (TI Colombia OR AB Colombia) OR (TI Comoros OR AB Comoros) OR (TI "Comoro Islands" OR AB "Comoro Islands") OR (TI Comores OR AB Comores) OR (TI Mayotte OR AB Mayotte) OR (TI Congo OR AB Congo) OR (TI Zaire OR AB Zaire) OR (TI "Cook Islands" OR AB "Cook Islands") OR (TI "Costa Rica" OR AB "Costa Rica") OR (TI "Cote d'Ivoire" OR AB "Cote d'Ivoire") OR (TI "Ivory Coast" OR AB "Ivory Coast") OR (TI Croatia OR AB Croatia) OR (TI Cuba OR AB Cuba) OR (TI Cyprus OR AB Cyprus) OR (TI Djibouti OR AB Djibouti) OR (TI "French Somaliland" OR AB "French Somaliland") OR (TI Dominica OR AB Dominica) OR (TI "Dominican Republic" OR AB "Dominican Republic") OR (TI "East Timor" OR AB "East Timor") OR (TI "East Timur" OR AB "East Timur") OR (TI "Timor Leste" OR AB "Timor Leste") OR (TI Ecuador OR AB Ecuador) OR (TI Egypt OR AB Egypt) OR (TI "United Arab Republic" OR AB "United Arab Republic") OR (TI "El Salvador" OR AB "El Salvador") OR (TI Eritrea OR AB Eritrea) OR (TI Ethiopia OR AB Ethiopia) OR (TI "Falkland Islands" OR AB "Falkland Islands") OR (TI "Las Malvinas" OR AB "Las Malvinas") OR (TI Fiji OR AB Fiji) OR (TI Gabon OR AB Gabon) OR (TI "Gabonese Republic" OR AB "Gabonese Republic") OR (TI Gambia OR AB Gambia) OR (TI Gaza OR AB Gaza) OR (TI "Georgia Republic" OR AB "Georgia Republic") OR (TI "Georgian Republic" OR AB "Georgian Republic") OR (TI Ghana OR AB Ghana) OR (TI "Gold Coast" OR AB "Gold Coast") OR (TI Greece OR AB Greece) OR (TI Grenada OR AB Grenada) OR (TI Guatemala OR AB Guatemala) OR (TI Guinea OR AB Guinea) OR (TI Guam OR AB Guam) OR (TI Guadeloupe OR AB Guadeloupe) OR (TI Guiana OR AB Guiana) OR (TI Guyana OR AB Guyana) OR (TI Haiti OR AB Haiti) OR (TI Honduras OR AB Honduras) OR (TI "Hong Kong" OR AB "Hong Kong") OR (TI India OR AB India) OR (TI Maldives OR AB Maldives) OR (TI Indonesia OR AB Indonesia) OR (TI Iran OR AB Iran) OR (TI Iraq OR AB Iraq) OR (TI Jamaica OR AB Jamaica) OR (TI Jordan OR AB Jordan) OR (TI Kazakhstan OR AB Kazakhstan) OR (TI Kazakh OR AB Kazakh) OR (TI Kenya OR AB Kenya) OR (TI Kiribati OR AB Kiribati) OR (TI Korea OR AB Korea) OR (TI Kosovo OR AB Kosovo) OR (TI Kuwait OR AB Kuwait) OR (TI Kyrgyzstan OR AB Kyrgyzstan)	

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4	#1 AND #2 AND #3	27,732
5	#4 AND Limit by: Publication Year: 20080101-20250108	22,985
6	#5 AND Limit by: Source Type: Academic Journals OR Reports	22,336
7	#6 AND Narrow by: English Language	20,437
Total		20,437

Tag categories for evidence map of environmental health services in healthcare facilities

Supplementary Table 4. Tag categories and definitions for the classification of studies included in the evidence map of environmental health services in healthcare settings in low- and middle-income countries

Environmental health services	
Tag	Definition
Water	- Water infrastructure - Water quality - Water quantity/accessibility - Behaviors related to water testing and treatment
Sanitation	- Toilet or latrines - Menstrual hygiene management - Wastewater treatment and disposal
Hygiene at the point of care	- Healthcare worker hand hygiene behavior/compliance – including studies that measure knowledge or observe behaviors of hygiene during clinical care - Studies that apply the WHO Five Moments for Hand Hygiene guidelines - Studies that examine hand hygiene specifically for infection prevention and control - Studies that examine “universal precautions” or “standard precautions” for infection control if services are not otherwise specified - Hand hygiene supplies available in patient care settings/at the point of care (e.g., soap, alcohol-based hand rub, surgical scrub) - Scrubbing, eye wash stations, and other infrastructure/supplies for body decontamination associated with clinical care - Usage of personal protective equipment (PPE) during patient care - Microbiology studies of hand contamination of healthcare workers
Hygiene outside the point of care	- Hand hygiene supplies and behaviors in settings other than the point of care (e.g., waiting rooms, offices, laboratories, bathrooms) - Hand hygiene behaviors by patients and caregivers - IPC measures performed outside the point of care – e.g., sterilization and disinfection of items that are used in a patient care environment - Use of PPE outside the point of care, except for waste management and cleaning - Shower and bathing facilities for patients
Waste	- Healthcare waste, including sharps safety, infectious waste, hazardous waste, and general waste - Waste collection, segregation, storage, treatment, and disposal - Infrastructure for waste management (e.g., incinerators) - Use of personal protective equipment (PPE) during waste handling and disposal
Cleaning	- Supplies, behaviors, and infrastructure for general cleaning of surfaces in patient and non-patient spaces, cleaning of infectious or hazardous spills, or disinfecting surfaces and devices - Cleaning supplies (e.g., brooms, mops, disinfectants, hypochlorite) - Studies reporting levels of cleanliness on bathrooms, wards, etc. (if bathrooms, also tag as sanitation)

	- Studies that take samples from surfaces or medical devices to assess microbiological contamination and cleanliness
Laundry	Infrastructure, supplies, and behaviors related to laundry and linens
Study design	
Tag	Definition
Qualitative	Uses qualitative methods, including interviews, focus groups, workshops, ethnographic research, and expert elicitation.
Review	A systematic, scoping, critical, etc. review of published literature that does not include primary data collection.
Cross-sectional survey	- Uses surveys, structured observations, environmental sample collection, or another quantitative method to examine environmental health services at <i>one point</i>. It also includes simulation/modeling studies based on survey data collection. - Does not evaluate an intervention/compare an intervention to a control
Longitudinal survey	- Uses surveys, structured observations, environmental sample collection, or other quantitative methods to examine services repeatedly across multiple (two or more) time points. - Does not evaluate an intervention
Non-experimental intervention	Measures the effect of an intervention but does <i>not</i> use randomized controlled trial methods (in other words, participants are not randomly assigned to the intervention or control group). Includes before-and-after studies, interrupted time series, case-control, and natural experiments.
Experimental intervention	A randomized controlled trial/experiment to measure the effect of an intervention. One group receives an intervention, while the other group serves as a control. Participants in the intervention and control groups are selected randomly from the population.
Other/not specified method	The study is a research study, but it uses a method that is not covered in the above definitions.
Policy/practice relevance: Eight Practical Steps	
Tag	Definition
Step 1A: Conduct situation analysis	- Assessments of the policy landscape or “enabling environment” for environmental health services - Studies that describe management-level, government, or policy-level readiness or barriers for WASH improvements (from the level of the facility up to the national level)
Step 1B: Conduct baseline assessment	- Quantitative descriptions of environmental coverage/access - Studies that use an assessment tool to evaluate baseline conditions (e.g., the WASH FIT tool) - Studies that describe healthcare worker or patient knowledge, attitudes, practices, and behaviors (KAP) related to environmental health services
Step 1C: Formative research	- Studies that propose “formative pathways” for environmental health services, i.e., examine links between exposures and outcomes along the impact pathway - Uses any method to establish associations between variables – e.g., regression, observational, qualitative research - Does not include an intervention

	- Studies that examine “associations,” “predictors,” or use regression analysis are likely included here. Qualitative studies that describe worker or patient perspectives on environmental health services are likely included here.
Step 2: Set targets and establish a coordination mechanism	- Studies that report on the creation of national plans, roadmaps, and task forces for environmental health services - Budgeting and costing for environmental health services
Step 3: Establish national WASH standards or healthcare waste standards	- Studies that describe the process of developing national standards for environmental health services or infection control - Studies that examine standards and accountability mechanisms for environmental health services
Step 4: Improve and maintain environmental health services	- Studies that (a) modify environmental health services through an intervention, program, or implementation strategy and (b) study the effects of these modifications - Any intervention – including interventions to modify environmental infrastructure, behaviors, operations/maintenance, etc. - Any study design, including experimental, quasi-experimental, or pretest-posttest - Impact and process evaluations for interventions or policies - Studies that evaluate factors influencing long-term operations, maintenance, and sustainability of interventions/programs
Step 5: Monitor and review data	A longitudinal assessment of environmental health services that is conducted with routine monitoring data (e.g., district health information system data)
Step 6: Develop a health workforce	- Studies to assess healthcare worker knowledge, attitudes, and behaviors related to environmental health services - Studies that involve quality improvement or training to improve healthcare worker knowledge/behavior - Includes studies that assess or improve healthcare worker knowledge and behavior related to hand hygiene, infection control measures, waste management, cleaning, etc. - Studies of medical student knowledge/behaviors
Step 7: Engage communities	Uses participatory research approaches to engage patients or other communities outside of the healthcare system
Topic/population focus	
Tag	Definition
COVID	Examines environmental health services and related behaviors in healthcare facilities during the COVID-19 pandemic, COVID-19 preparedness, or impacts of COVID-19
Other epidemics	Examines environmental health services and related behaviors in healthcare facilities during non-COVID outbreaks, epidemics, and pandemics. E.g., Ebola, Lassa fever, influenza
Climate	Evaluates relationships between climate and healthcare facility environmental health services – including topics such as climate resilience, impacts of extreme weather events, and climate emergency preparedness
Maternal	Studies that examine environmental health services in maternal, child, and newborn health settings. Includes studies conducted in healthcare settings where the primary purpose is maternal and child health (including antenatal care, labor and delivery, postnatal/neonatal, and pediatrics). This could include facilities specializing in maternal/child health or specialized wards/departments within a more general facility.

	Includes studies that examine the impacts of environmental health services among populations of pregnant women, newborns, or children under age five
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