

Fact Sheet: Impact of Water, Sanitation and Hygiene on Reproductive, Maternal, Newborn and Child Health

“Creating equitable and sustainable access to safe water and improved sanitation and hygiene can **dramatically benefit** reproductive, maternal, neonatal and child health.”

(The Partnership for Maternal, Newborn and Child Health, 2014)

WASH and Health

- An estimated 58% of diarrheal cases are related to unsafe water, inadequate sanitation, and/or a lack of hygiene (Prüss-Ustün, 2014).

Pregnant Women

- “In developing countries, an estimated 10–15% [of maternal deaths], are due to infections that can be directly linked to unhygienic conditions during labour and birth, at home or in facilities, and to poor hygiene practices in the six weeks after birth.” (PMNCH, 2014)

Newborns and Children

- About 1,000 children die each day because of unsafe drinking water, inadequate sanitation and poor hygiene (Prüss-Ustün, 2014).
- Globally, the two leading causes of death of children (1 month–5 years old) are pneumonia and diarrhea (Liu et al., 2012). The two diseases are not independent. In many cases, having been sick with diarrhea increases a young child’s risk of becoming infected with an acute respiratory illness, such as pneumonia (Walker et al. 2013)
- “50% of global malnutrition is due to waterborne diseases such as diarrhea and intestinal worms, and 25% of stunting can be attributed to five or more episodes of diarrhea before two years of age (PMNCH, 2014).”
- “Of the 555 million preschool children in developing countries, 32% are stunted and 20% are underweight... This leads to long-term cognitive deficits, poorer performance in school and fewer years of completed schooling, and lower adult economic productivity.” (Humphrey, 2009)

WASH Interventions

- Diarrhea in infants can be decreased by more than one third when mothers practice proper handwashing, food hygiene and household hygiene. Safe disposal of feces decreases the risk of diarrhea in infants by 37% (PMNCH, 2014).

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- “Interventions targeting five pathogens (rotavirus, *Shigella*, ST-EPEC, *Cryptosporidium*, and typical enteropathogenic *E coli*) can substantially reduce the burden of moderate-to-severe diarrhea,” in children under the age of five in sub-Saharan Africa and South Asia (Kotloff et al., 2013). Exposure to all five of these pathogens can be reduced by improving the use of safe water and adequate sanitation, as well as by improving hygiene practices.
- “Improved drinking water, sanitation and hygiene also lead directly to improved child growth and development.” (PMNCH, 2014)
- “Access to improved water sources within the community can decrease maternal mortality by decreasing the risk of intestinal worms and thus anemia and diarrheal diseases, which lead to nutritional deficiencies, and hepatitis.” (PMNCH, 2014)

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WASH-Related Diseases of Particular Concern for the Health of Pregnant Women, Newborns and Children

Important WASH-related diseases for maternal, newborn and child health are listed in the following table.

Disease	Pathogen Type	Water, Hygiene or Sanitation Related	Symptoms ¹	Impacts ²
Ascariasis (roundworm)	Helminth	<ul style="list-style-type: none"> Sanitation Hygiene 	Often no symptoms, may have stomach pain, cough due worms migrating through the body	<ul style="list-style-type: none"> In pregnant and women and children, the disease causes anemia. Pregnant women and children with anemia have a higher risk of death. Impacts children's growth and cognitive development.
Cholera	Bacteria	<ul style="list-style-type: none"> Water Sanitation Hygiene 	Watery diarrhea, fever, severe dehydration	<ul style="list-style-type: none"> In pregnant women, fetuses, newborns and children, there is a higher risk of death. Fetuses are at a higher risk of premature birth³.
Cryptosporidiosis	Protozoa	<ul style="list-style-type: none"> Water Sanitation 	Diarrhea (often severe and persistent ⁴)	<ul style="list-style-type: none"> In pregnant women and children living with HIV/AIDS there is a higher risk of death. Impacts children's growth and cognitive development.
Giardiasis	Protozoa	<ul style="list-style-type: none"> Water Sanitation Hygiene 	Diarrhea, stomach pain	<ul style="list-style-type: none"> In pregnant women, causes poor absorption of nutrients. Linked to zinc deficiencies and persistent diarrhea in children.
Hepatitis E	Virus	<ul style="list-style-type: none"> Water Sanitation Hygiene 	Diarrhea, excessive fatigue, lack of appetite	<ul style="list-style-type: none"> In pregnant women, the disease is more severe with death rates of approximately 20% for women in their third trimester. Fetuses are at a higher risk of death or premature birth. Newborns have a higher risk of death.
Hookworm	Helminth	<ul style="list-style-type: none"> Sanitation Hygiene 	Rash, diarrhea, stomach pain, lack of appetite	<ul style="list-style-type: none"> In pregnant women and children, the disease causes anemia. Pregnant women and children with anemia have a higher risk of death. Impacts children's growth and cognitive development.

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Disease	Pathogen Type	Water, Hygiene or Sanitation Related	Symptoms ¹	Impacts ²
Malaria	Protozoa	<ul style="list-style-type: none"> Environmental hygiene 	Fever, headache, nausea and vomiting	<ul style="list-style-type: none"> In pregnant women, it contributes to anemia. Fetuses are at higher risk of death and low birth weight⁶. In children, it contributes to anemia.
Rotavirus	Virus	<ul style="list-style-type: none"> Sanitation Hygiene 	Diarrhea, vomiting, severe dehydration	<ul style="list-style-type: none"> In children, it is a leading cause of death. It causes an estimated 40% of hospital admissions for diarrhea, in children.
Schistosomiasis	Helminth	<ul style="list-style-type: none"> Sanitation Exposure to contaminated water 	Diarrhea, damage to internal organs	<ul style="list-style-type: none"> In pregnant women and children, it contributes to anemia which has a higher risk of death. Fetuses have a higher risk of death and low birth weight. Impacts children's growth and cognitive development.
Toxoplasmosis	Protozoa	<ul style="list-style-type: none"> Water Hygiene 	Fever, confusion, headache, seizures, nausea, poor coordination	<ul style="list-style-type: none"> Fetuses have a higher risk of being born prematurely. Can cause death of the fetus or abnormalities. Children whose mother had toxoplasmosis while pregnant are more likely to have health problems as they grow.
Trachoma	Bacteria	<ul style="list-style-type: none"> Hygiene 	Blindness in adulthood	<ul style="list-style-type: none"> Pregnant women have a higher risk of trachoma. Children are the most vulnerable to the infection, but the most severe symptoms may not appear until adulthood (e.g. blindness).
Typhoid fever	Bacteria	<ul style="list-style-type: none"> Water Sanitation Hygiene 	Fever, diarrhea, stomach pain	<ul style="list-style-type: none"> Pregnant women may be more vulnerable to infection. Children are the most vulnerable to infection and death.

¹ Heymann, 2008

² For references about impacts see CAWST's Technical Brief on RMNCH and WASH-Related Diseases

³ Premature birth is a birth where the baby is born alive before 37 weeks of pregnancy are completed (WHO, 2014a).

⁴ Chronic (or persistent) diarrhea is diarrhea lasting 14 days or more. It is occurs most often in people with weak immune systems, such as people living with HIV/AIDS (WHO, 2013).




⁵ From (WHO, 2014b)

⁶ Low birth weight is the weight of a baby at birth of less than 2,500 grams (5.5 pounds). Infants weighing less than 2,500 grams are approximately 20 times more likely to die than heavier babies (UNICEF, 2004).

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Impact of WASH-Related Diseases on RMNCH

This table shows the impact of four WASH-related diseases on pregnant women, fetuses, newborns and children.

WASH-Related Diseases	Cholera	Hepatitis E	Toxoplasmosis	Schistosomiasis
	Caused by drinking contaminated water and eating contaminated food	Caused by drinking contaminated water and eating contaminated food	Caused by drinking contaminated water and eating contaminated food	Caused by contact with contaminated water (including bathing or swimming)
 Pregnant Women	Pregnant women are two times more likely to die	20% of pregnant women may die	Pregnant women are six times more likely to miscarry	65% of pregnant women have anemia
 Fetuses	30% of fetuses die	45% of fetuses are born prematurely	Fetuses are three times more likely to be born prematurely. Fetuses are almost six times more likely to be born with a fetal abnormality.	45% of fetuses are born with low birth weight
 Newborns and children	Newborns are eight times more likely to die than adults (Africa and Asia)	25% of newborns die		40% of children have higher rates of anemia

Statistics from the table are sourced from the following studies: Ahmed et al., (2013), Ali et al., (2012), Beniwal et al., (2003), Bista and Rana (2006), Boccia (2006), Brooker et al., (2008), ICDDR, B (2009), Jaiswal et al., (2001), Khuroo et al., (2001), Kumar et al., (2004), Li et al., (2014), Patra et al., (2007), Shresta et al., (2011), Sing et al., (2003), Smith and Brooker (2010), Sousa-Figueredo et al., (2012), Thomson et al., (2013), Tsega et al., (1992). For complete references see CAWST's Technical Brief on RMNCH and WASH-Related Diseases.

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Additional Resources

CAWST (2014). Reproductive, Maternal, Newborn and Child Health and WASH. CAWST, Calgary, Canada. Available at: www.cawst.org/resources

- In these materials, you will find Technical Briefs describing the link between RMNCH and WASH, how to address the issues through WASH, a Literature Summary, and Fact Sheets about household water treatment technologies and their effectiveness for RMNCH.

Partnership for Maternal, Newborn, and Child Health (2014). PMNCH Knowledge Summary #30 Water, sanitation and hygiene - the impact on RMNCH. Available at: <http://www.who.int/pmnch/knowledge/publications/summaries/ks30/en/>

- This research summary identifies links between water, sanitation and hygiene and maternal, newborn and child health. It summarizes WASH interventions for RMNCH and their impact.

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World Health Organization (2013). Fact Sheet 330: Diarrhoeal Disease. World Health Organization, Geneva, Switzerland. Available at: www.who.int/mediacentre/factsheets/fs330/en/

World Health Organization (2014a). Fact Sheet 363: Preterm Birth. World Health Organization, Geneva, Switzerland. Available at: www.who.int/mediacentre/factsheets/fs363/en/

World Health Organization (2014b). Fact Sheet 280: Hepatitis E. World Health Organization, Geneva, Switzerland. Available at: www.who.int/mediacentre/factsheets/fs280/en/

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Wellness through Water.... Empowering People Globally
Last Update: May 2015

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