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IMPORTANT WASH RELATED DISEASES IN REFUGEE SETTINGS

CHOLERA

An acute bacterial enteric disease characterized in its severe form by sudden onset, profuse painless watery stools (rice-water stool), nausea and profuse vomiting. In untreated cases, rapid dehydration, acidosis, circulatory collapse, and renal failure can rapidly lead to death. In most cases infection is asymptomatic or causes mild diarrhea, especially with organisms of the El Tor biotype; asymptomatic carriers can transmit the infection. In severe dehydrated cases (cholera gravis), death may occur within a few hours, and the case-fatality rate may exceed 50%. With proper and timely rehydration, this can be less than 1%. Complex emergencies resulting in population movements as well as overcrowded refugee camps are conducive to explosive outbreaks with high case fatality rates. An outbreak of *V. cholerae* El Tor among Rwandan refugees in Goma, Democratic Republic of the Congo, in July 1994 resulted in more than 50 000 cases and 24 000 deaths over the course of little more than one month. Cholera is acquired through ingestion of an infective dose of contaminated food or water and can be transmitted through many mechanisms. Water usually is contaminated by feces of infected individuals and can itself contaminate, directly or through the contamination of food. Contamination of drinking water occurs usually at source, during transportation or during storage at home. Food may also be contaminated by soiled hands during preparation or while eating. In funeral ceremonies transmission may occur through consumption of food and beverages prepared by family members after they handled the corpse for burial. *V. cholerae* O1 and O139 can persist in water for long periods and multiply in moist leftover food. Contaminated beverages, ice cream, bottled water, and rice have been incriminated as vehicles in cholera transmission. *V. cholerae* introduced by a food handler into one of these foods and stored unrefrigerated can increase by several logs within 8-12 hours.

- Educate the public regarding the importance of handwashing. Provide suitable handwashing facilities, particularly for food handlers and attendants involved in the care of patients and children.
- Prevent open defecation.
- Increase coverage of clean and fly-proof latrines and encourage use.
- Protect water sources through sanitary upgrading.
- Chlorinate all public water supplies to at least 0.5 mg/l regardless of use.
- Prevent contamination of water during transport and storage.
- Increase water quantity.
- Promote scrupulous cleanliness in food preparation food hygiene practices.
- Encourage handwashing with soap at critical times.
- Control fly populations through measures including improved solid waste management, baits, traps, and latrine improvements.
- Promote safe funeral practices.

SHIGELLOSIS (BLOODY DIARRHEA)

An acute bacterial disease characterized by loose stools of small volume accompanied by fever, nausea and sometimes toxæmia, vomiting, cramps and tenesmus. In typical cases, the stools contain blood and mucus (dysentery) resulting from mucosal ulcerations. Case-fatality rates have been as high as 20% with some types. The infectious dose for humans is very low (10–100 bacterium). Outbreaks occur in crowded refugee camps where personal hygiene is poor. Transmission is mainly by direct or indirect faecal-oral transmission from a symptomatic patient or a short-term asymptomatic carrier. Infection may occur after the ingestion of contaminated food or water as well as from person to person. Individuals primarily responsible for transmission include those who fail to clean hands thoroughly after defecation. They may spread infection to others directly by physical contact or indirectly by contaminating food. Flies can transfer organisms from latrines to uncovered food items.

- Educate the public on modes of transmission and protection.
- Prevent open defecation.
- Increase coverage of clean and fly-proof latrines and encourage use.
- Protect water sources through sanitary upgrading.
- Chlorinate all public water supplies to at least 0.5 mg/l regardless of use.
- Prevent contamination of water during transport and storage.
- Increase water quantity.
- Encourage proper food hygiene practices.
- Encourage handwashing with soap at critical times.
- Control fly populations through measures including improved solid waste management, baits, traps, and latrine improvements.

TYPHOID FEVER

A systemic bacterial disease caused by *Salmonella typhi* with insidious onset of sustained fever, marked headache, malaise, anorexia, relative bradycardia, splenomegaly, non-productive cough in the early stage of the illness, rose spots on the trunk in 25% of white-skinned patients and constipation more often than diarrhoea in adults. Transmission is through ingestion of food and water contaminated by faeces and urine of patients and carriers. Important vehicles include raw fruit and vegetables, and contaminated milk/milk products (usually through hands of carriers). Flies may infect foods in which the organism then multiplies to infective doses.

- Prevention of open defecation.
- Increase coverage of clean and fly-proof latrines and encourage use.
- Sanitary protection of water sources.
- Prevent contamination of water during transport and storage.
- Increase water quantity.
- Encourage proper food hygiene practices.
- Encourage handwashing with soap at critical times.
- Fly control measures including improved solid waste management

HEPATITIS A and E

Viral hepatitis include several distinct infections (A, B, C, D, E), which share similar clinical presentations but differ in epidemiology, prevention and control. Hepatitis A is usually abrupt in adults with fever, malaise, anorexia, nausea and abdominal discomfort, followed within a few days by jaundice. Transmission is person-to-person by the fecal-oral route. Common source outbreaks have been related to contaminated water, food contaminated by infected food handlers, including foods not cooked, or handled after cooking. Hepatitis E infection has symptoms similar to that of hepatitis A with a case-fatality rate similar to that of hepatitis A except in pregnant women, where it may reach 20% among those infected during the third trimester of pregnancy. Both A and E epidemics can occur where water and sanitation provision is poor and there is overcrowding.

- Educate the public on modes of transmission and protection.
- Prevent open defecation.
- Increase coverage of clean and fly-proof latrines and encourage use.
- Protect water sources through sanitary upgrading.
- Chlorinate all public water supplies to at least 0.5 mg/l regardless of use.
- Prevent contamination of water during transport and storage.
- Increase water quantity.
- Encourage proper food hygiene practices in particular thoroughly cooking all animal foodstuffs. Avoid recontamination from uncooked foods within the kitchen.
- Encourage handwashing with soap at critical times.
- Control fly populations through measures including improved solid waste management, baits, traps, and latrine improvements.

MALARIA

A parasitic disease caused by four types of protozoan Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale and Plasmodium malariae with similar symptoms including fever, chills, sweats, anorexia, nausea, lassitude, headache, muscle and joint pain. Transmission is via the bites of an infective female Anopheles mosquito feeding primarily at dusk or in the early morning. Malaria is frequently a leading cause of morbidity in refugee settings, and an important cause of death among adult refugees. It is already a major health problem in many countries hosting refugee populations.

- Educate the public on modes of transmission and protection.
- Control larval stages of mosquito development by elimination of mosquito breeding sites.
- Encourage treated bednet use.
- Conduct indoor residual spraying with insecticides (IRS).
- Encourage the population to avoid going out between dusk and dawn when anopheline mosquitoes bite.
- Encourage the population to wear long sleeved clothing and long trousers when going out at night.
- Encourage the population to apply insect repellent at night.
- Screens doors and windows.
- Use pyrethroid coils at night.
- Baits, traps, and latrine improvement.

DENGUE FEVER AND DENGUE HEMORRHAGIC FEVER

An acute viral disease. Infection is frequently asymptomatic, or leads to one of the two clinical forms of dengue: dengue fever and dengue haemorrhagic fever. Dengue fever is characterized by sudden onset fever, intense headache, myalgia, arthralgia, retro-orbital pain, anorexia, nausea, vomiting and rash. Dengue haemorrhagic fever and dengue shock syndrome (DHF/DSS) are severe illnesses: after a classical symptoms, the patient suddenly deteriorates and develops haemorrhages. Warning signs include intense continuous abdominal pain with persistent vomiting. Hemorrhagic phenomena occur frequently with accumulation of fluids in serosal cavities. Case fatality rates are typically high (10%-60%). Transmission is via the bite of infective mosquitoes, principally *Aedes aegypti*. This is a day biting species, with increased biting activity for 2 hours after sunrise and several hours before sunset.

- Educate the public on modes of transmission and protection.
- Control larval stages of mosquito development by elimination of mosquito breeding sites which are usually artificial water-holding containers close to or inside human habitations e.g. old tires, flowerpots, discarded coconut shells, or containers for food or water storage.
- Conduct larvae surveys and observation walks to identify the most productive larval habitats and implement plans for their elimination, management, or treatment with appropriate larvicides.
- Encourage insecticide treated bednet use.
- Conduct indoor residual spraying with insecticides (IRS).
- Encourage the population to wear long sleeved clothing and long trousers.
- Encourage the population to apply insect repellent to exposed skin.
- Use screens over doors and windows.
- Use anti-mosquito sprays or pyrethroid mosquito coils.