

Health Risks of Sewage



Key Points

Untreated sewage contains a wide array of pathogens, chemicals and nutrients, many of which pose a serious threat to human health.

Sewage pollution is a growing problem as funding for infrastructure decreases, old pipes crumble and urbanization increases stormwater runoff.

We must strengthen state and federal public notification laws so that all Americans are informed of this serious health threat.

Key Statistics

The EPA estimates there are 23,000 - 75,000 SSOs annually.

Over 850 million gallons of untreated sewage overflows from combined sewer systems every year.

Between 1.8 and 3.5 million people get ill from recreational contact with waters contaminated by an SSO every year.

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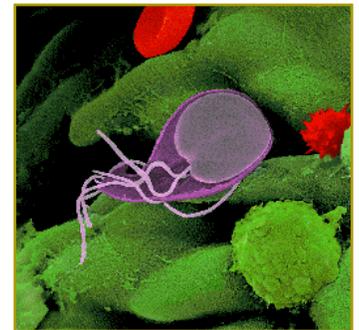
The Health Risks of Untreated Sewage

Every year hundreds of billions of gallons of untreated sewage flow into our rivers, lakes, and coastal waters. Unknowingly, many Americans and their loved ones risk serious illness when untreated sewage seeps into the water they use for recreation or drinking. The EPA estimates that up to 3.5 million people fall ill from swimming in waters contaminated by sanitary sewer overflows alone every year. However, the number of illnesses caused by raw sewage could be much higher than we think. Many people that get sick from untreated sewage aren't aware of the cause of their illness and don't report it to their doctors or local health officials. A recent study found that up to 1.5 million people get gastroenteritis at beaches in two counties in California each year. If this is the case, the number could be much higher.

Pathogens

Most illnesses that arise from contact with sewage are caused by pathogens, which are biological agents that cause disease or illness in a host. The most common pathogens in sewage are bacteria, parasites, and viruses. They cause a wide variety of acute illnesses including diarrhea and infections. These illnesses can be violent and unpleasant, but mostly pass after several days or weeks with no lasting effects. In some cases, however, pathogens can cause serious long-term illnesses or even death.

Certain groups such as children, the elderly, and those with a weakened immune system are particularly vulnerable to these long-term effects. When the parasite *cryptosporidium* contaminated the drinking water supply in Milwaukee in 1993, 403,000 people became ill and 70 -100 people died, the vast majority of whom had been HIV-positive. The illnesses caused by pathogens commonly found in untreated sewage are summarized below.



Courtesy of Joan Rose Presentation

Toxic Algal Blooms

In addition to pathogens, the high nutrient levels in untreated sewage can cause illness when they create algal blooms. Algal blooms are rapid increases in the population of phytoplankton algae, or single-celled plants that serve as an important food source to other



Courtesy of W. Australia Dept. of Health

organisms. The nutrients in sewage act as fertilizers and cause the number of algae to swell. Some algae are toxic to humans who can come in contact with them from eating shellfish or swimming or boating in contaminated water. Symptoms from exposure include memory loss, vomiting, diarrhea, abdominal pain, liver failure, respiratory paralysis, and coma. If an affected person does not receive proper medical attention, some toxins can be fatal.

	Agent	Acute Effects	Chronic or Ultimate Effects
Bacteria	<i>E. coli</i> 0157:H7	Diarrhea	Death, Hemolytic Uremic syndrome
	<i>Legionella pneumoniae</i>	Fever, pneumonia	Elderly: death
	<i>Helicobacter pylori</i>	Gastritis	Ulcers and stomach cancer
	<i>Vibrio cholerae</i>	Diarrhea	Death
	<i>Vibrio vulnificus</i>	Skin and Tissue infection	Death in those with liver problems
	<i>Campylobacter</i>	Diarrhea	Death: Guillain-Barré syndrome
	<i>Salmonella</i>	Diarrhea	Reactive arthritis
	<i>Yersinia</i>	Diarrhea	Reactive arthritis
	<i>Shigella</i>	Diarrhea	Reactive arthritis
	<i>Cyanobacteria</i>	Diarrhea	Potential Cancer
	<i>Leptospirosis</i>	Fever, headache, chills, muscle aches, vomiting	Weil's Disease, kidney damage, liver failure, death
	<i>Aeromonas hydrophila</i>	Diarrhea	
Parasites	<i>Giardia lamblia</i>	Diarrhea	Children: Failure to develop physically and mentally
	<i>Cryptosporidium</i>	Diarrhea	Immunocompromised: death
	<i>Toxoplasma Gondii</i>	Newborn syndrome, hearing and visual loss, mental retardation	Dementia, seizures
	<i>Acanthamoeba</i>	Eye infections	
	<i>Microsporidia</i>	Diarrhea	
	<i>Entamoeba cayetanensis</i>	Amebiasis, amoebic dysentery, abscess in liver or other organs	
Viruses	Hepatitis viruses	Liver infection	Liver failure
	Adenoviruses	Eye infections, diarrhea, respiratory disease	
	Caliciviruses	Diarrhea	
	Coxsackieviruses	Encephalitis, Aseptic meningitis	Heart disease, diabetes
	Echoviruses	Aseptic meningitis	
	Polyomaviruses		Cancer of the colon

Pharmaceuticals and Other Compounds

There is growing concern about the illnesses caused by pharmaceuticals, synthetic hormones, personal care products and other pollutants found in many waterways across the country. Many of them enter the environment through the sewage system. Certain compounds called endocrine disruptors may disrupt processes in humans that are controlled by hormones, including development, growth, and reproduction. These compounds are already thought to be causing cancer and genetic defects in fish. Little is known about how these chemicals affect human health over time and even less is known about how multiple chemicals interact in the human body. Contact with raw sewage could be having greater effects than we know.



Courtesy of University College Dublin

Solutions

All people deserve clean water free of the many dangerous pollutants found in sewage. The only way to ensure this is to stop sewage overflows and leaks and ensure that no sewage is released into our streams, rivers, and lakes untreated. It will cost hundreds of billions of dollars and take decades to update the nation's wastewater infrastructure to this level, and funding for wastewater infrastructure has been cut in recent years. Until we make significant progress towards reducing sewage in our water, there must be strong notification programs that will alert people when there is a danger of contacting raw sewage. Wastewater facilities should be required to notify the media, citizens, and environmental agencies when they release untreated sewage into the environment. American Rivers works for federal and state right-to-know policies that require citizens to be informed of sewage contamination in their waterways. Not only will such programs keep people healthy by avoiding raw sewage, but it will also galvanize further support for solutions to reduce sewage pollution.