

TRANSMISSION FACTORS AND PREVENTION
MEASURES FOR INTESTINAL INFECTIOUS DISEASES IN
THE GENERAL POPULATION

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Annotation: *This thesis analyzes the primary etiological and socio-environmental determinants driving intestinal infectious disease transmission in the general population, and evaluates evidence-based preventive frameworks. The study underscores that integrated water-sanitation-hygiene interventions and targeted vaccination strategies can substantially reduce the global burden of enteric infections.*

Keywords: *intestinal infectious disease, fecal-oral transmission mechanism, enteric pathogen, rotavirus, Salmonella, Shigella, oral rehydration therapy, water sanitation and hygiene, epidemiological surveillance, vaccination-preventable enteric infection.*

Today, intestinal infectious diseases remain among the most prevalent and epidemiologically significant communicable disease categories worldwide, representing a disproportionate public health burden across populations with limited access to safe water, sanitation infrastructure, and primary healthcare. According to global burden estimates, approximately 1.7 billion episodes of diarrheal disease are recorded annually, constituting the third leading cause of death among children under five years of age globally, with an estimated 525,000 child deaths occurring each year. The highest mortality rates - ranging

from 50 to 150 deaths per 100,000 population - are concentrated in sub-Saharan Africa and South Asia, regions sharing structural vulnerabilities in water safety, food hygiene regulation, and environmental sanitation directly analogous to those observed in Central Asian healthcare contexts.

Intestinal infectious diseases are defined as a pathologically and epidemiologically coherent group of infectious conditions united by the fecal-oral mechanism of transmission - the process by which pathogenic microorganisms exit the host organism via feces and subsequently enter a susceptible host through the oral route via contaminated water, food, household objects, or the hands of carriers. The leading etiological agents include bacterial pathogens - *Salmonella enterica*, *Shigella dysenteriae*, *Campylobacter jejuni*, enterotoxigenic and enteroaggregative *Escherichia coli*, and *Vibrio cholerae* - as well as viral agents, among which rotavirus and norovirus collectively account for the largest proportion of acute gastroenteritis episodes across all age groups, and parasitic pathogens including *Giardia intestinalis*, *Entamoeba histolytica*, and *Cryptosporidium parvum*. The epidemiological process of intestinal infection transmission is governed by the interaction of three interconnected determinants: the source of the infectious agent, the mechanism and pathways of its transmission, and the susceptibility of the receiving population. The source encompasses symptomatic patients, convalescent carriers, and chronic carriers who may shed viable pathogens for weeks or months in the absence of clinical symptoms, thereby sustaining endemic transmission without visible outbreak signals. Transmission pathways are classified into four operationally distinct categories: waterborne transmission - occurring through consumption of insufficiently purified or microbiologically compromised water supplies; foodborne transmission - arising from

consumption of improperly stored, thermally processed, or hygienically prepared food products, particularly raw animal products and unpasteurized dairy; contact-household transmission - mediated through shared domestic utensils, surfaces, towels, and inadequately washed hands; and vector-borne facilitation - involving mechanical transport of pathogens by arthropods, most commonly flies, from fecal sources to food surfaces in conditions of inadequate environmental sanitation.

Host susceptibility factors that substantially elevate individual infection risk include age below five years - owing to immunological immaturity and the absence of prior antigen exposure - age above 65 years, immunocompromised states including human immunodeficiency virus infection and cytotoxic immunosuppression, malnutrition particularly protein-energy deficiency, and artificial infant feeding in place of exclusive breastfeeding during the first six months of life. Seasonal variation is a recognized epidemiological determinant: bacterial intestinal infections demonstrate pronounced summer-autumn seasonality driven by elevated ambient temperature accelerating pathogen multiplication in food, while viral gastroenteritis - notably rotavirus - predominates during winter months in temperate climates.

Intestinal infectious diseases are predominantly preventable through systematically implemented water safety, food hygiene, and vaccination programs - priorities whose sustained institutional and regulatory commitment constitutes the foundational requirement for meaningful epidemiological control in contemporary public health practice.

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