Antibiotic Resistance and Water: A Public Health and Economic Challenge in Latin America

Why Antibiotic Resistance in Water Matters

ANTIBIOTIC RESISTANCE → MAJOR PUBLIC HEALTH THREAT

WATER CONTAMINATION: HOSPITALS, INDUSTRY, AGRICULTURE

LEADS TO HARDER-TO-TREAT INFECTIONS AND ECONOMIC LOSSES

The One Health Approach

Human, animal, and environmental health are interconnected

History: Rudolf Virchow (19th century) → zoonoses

Modern formalization: World Health Organization (WHO), Food and Agriculture Organization (FAO), World Organisation for Animal Health (WOAH) → (2000s)

Principles: prevention, surveillance, responsible antibiotic use, multisectoral collaboration

Regional Evidence – Latin America

Colombia: rivers contaminated with hospital/industrial waste

Chile: multi-resistant Gram-negative bacteria in rivers/lakes

Peru: resistant E. coli in Rímac River used for irrigation. Risk for crops and human consumption

Belize: urban rivers & coral reefs carry resistance genes

Paraguay: Paraná River basin shows human & animal antibiotic resistance. Strong link with wastewater and farming activities

Bolivia: La Paz River. Untreated domestic sewage

Socio-Economic Implications

Higher healthcare costs due to harder-to-treat infections

Lost productivity from illness

Reduced confidence in agricultural and fishery products

Tourism and agriculture sectors affected

Solutions – Water Treatment & One Health

ONE HEALTH → INTEGRATED POLICIES & COLLABORATION

INVEST IN WATER TREATMENT & REGENERATION TECHNOLOGIES

PREVENTIVE MEASURES REDUCE INFECTIONS AND ECONOMIC LOSSES