Sanitation is an important intervention for reducing the spread and burden of diseases transmitted by pathogens found in human faeces and urine. Since sanitation technologies (such as latrines, septic tanks, sewerage systems, etc.) are designed to interrupt the transmission of sanitation-related pathogens into the environment, then the number of pathogens that such technologies can inactivate before emptying or discharge to the environment, would seem a logical and useful indicator for assessing the performance of these technologies. However, to-date, the relative public health hazards posed by the different sanitation technologies is still not well understood. We, therefore, investigated the performance of different sanitation technologies in Tamil Nadu in reducing pathogen hazards. Fecal sludge or wastewater samples were collected from different sanitation technologies and analysed for Escherichia coli (E. coli), and Total solids. We also estimated the volume of human waste overflowing into the environment from the different sanitation technologies. Average daily E. coli per capita release was computed, and used for assessing the performance of sanitation technologies, with reference to blackwater pipes. The results revealed that there is a statistically significant and meaningful difference in the average daily E. coli release from different sanitation technologies, with p = 0.00001. Household (HH) lined tanks and lined pits exhibited excellent performance with approximately 3.8-5.1 Log10 E. coli reduction, followed by HH fully-lined tanks, Community toilets (CT) fully-lined tanks, and sanitary sewers with 1.7, 1.0, and 0.2 Log10 E. coli reduction, respectively. However, there was no statistically significant difference between the performance of CT fully-lined tanks and Sewerage systems (with p = 0.110). The study results suggest that safe containment of human excreta for an extended period has greater potential to reduce the release of pathogen hazards into the environment as well as the spread of excreta-related diseases since extensive pathogen inactivation usually occurs during containment.

Key Learning Objectives:

- To understand the average daily pathogen release to the environment associated with periodic desludging and overflows/ effluent from sanitation technologies.
- To understand the effectiveness of local sanitation technologies in reducing pathogen hazards, with a view to promote better priority setting and decision-making in sanitation.
- To understand design features of the containment systems and other factors that influence the pathogen hazards release from the sanitation technologies.