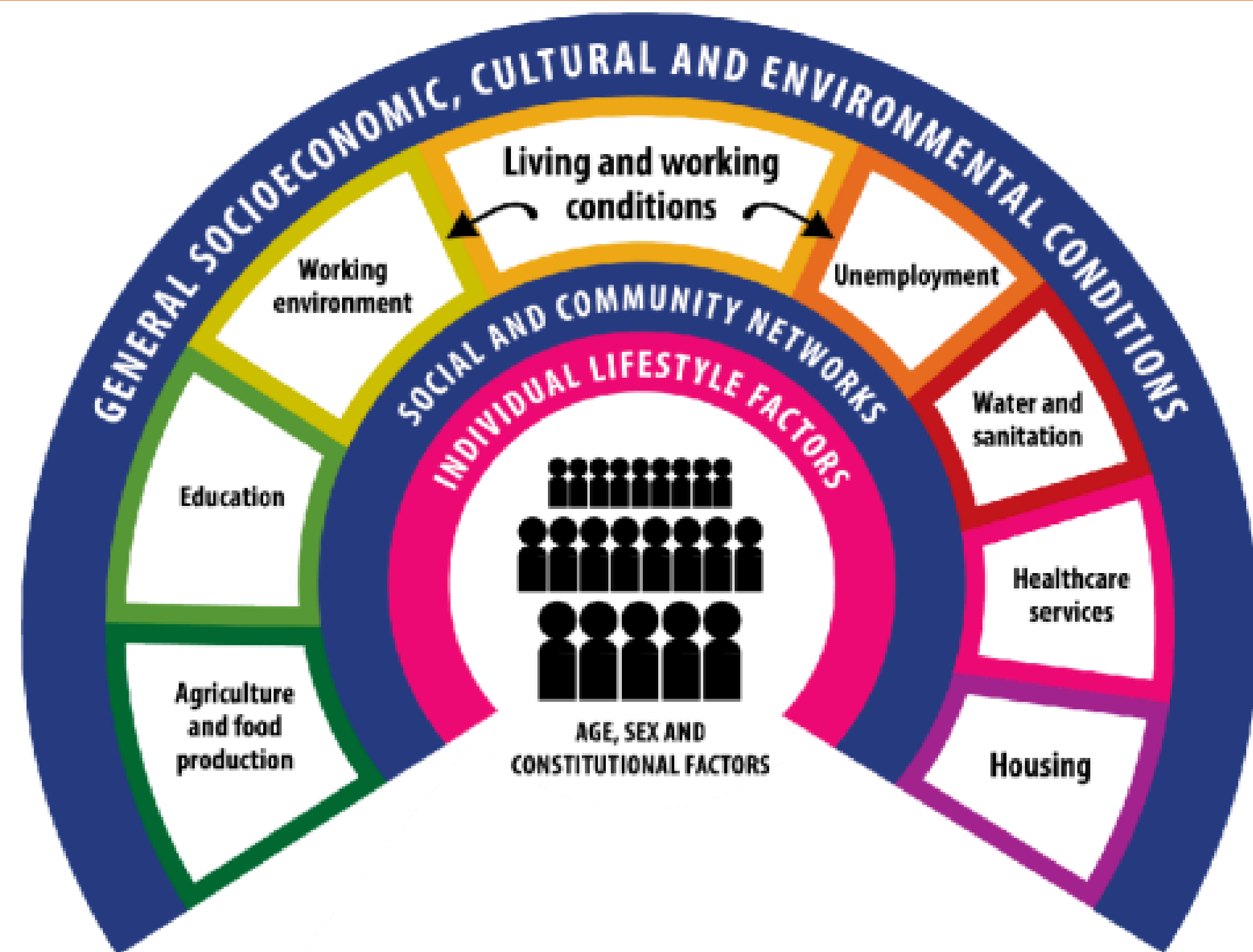


## 1.0 Introduction

A significant proportion of HIV-exposed infants (HEI) in Malawi live in poverty, face drinking water and hygiene challenges that impact negatively on their health. The study evaluated the potential contribution of water, sanitation and hygiene (WaSH) towards three outcomes: **diarrhea prevention, linear growth trajectory and disease progression** among HEI and people living with HIV/AIDS in Kasungu, Malawi.

## 2.0 Literature Review

HEIs are 4 times more at risk of diarrhea; 6 times more likely if caregiver has diarrhea and 11 times more likely to die from diarrhea (Peletz et al., 2012; Eijk et al., 2010). Access to safe water and sanitation (SDG 6) is a catalyst for meeting many of the other SDG targets including Good health and well-being (SDG 3), Economic growth (SDG 8), and Reduced inequalities (SDG 10).



### Figure 1: The Social Determinants of Health.

Source: Dahlgren and Whitehead (1991)

SDH account for up to 55% of health outcomes and clearly exceeding the contribution from medical causality (Canadian Institute of Advanced Research, 2012).

*Given the dreadful state of living conditions among most PLWHA, biomedical interventions alone though necessary, are insufficient and narrow in scope; an expanded response to address exposed infants' vulnerability to HIV/AIDS offers them a more pragmatic recourse.*

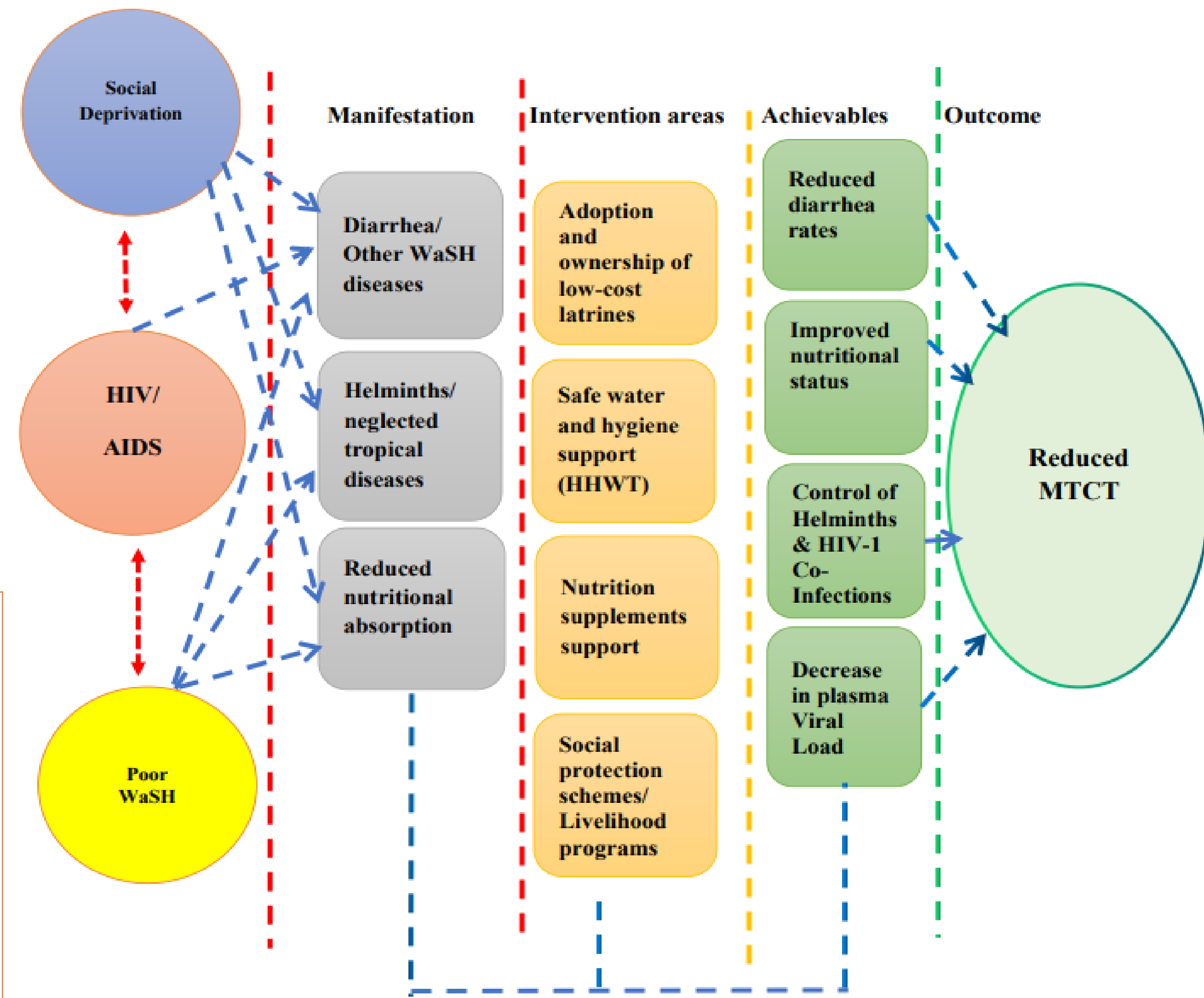


Fig 2: The Conceptual Framework

This conceptual framework postulates a need for recognition of SDH as these directly affect their vulnerability to infections

## 3.0 Materials and Methods

Systematic random sampling (facility and household)

Cross-sectional study of HEIs aged 6 weeks- 24 months

The sample size was generated using Slovin's (1960) formula.

$$n = N / (1 + Ne^2)$$

### Systematic Literature Search

PubMed, EMBASE, PsycINFO, AMED, CINAHL, DOAJ & Google Scholar databases guided by the acceptance practice developed by PROSPERO and COCHRANE. PRISMA guidelines and a Mixed Method Appraisal Tool (MMAT) were used for aggregation and evaluation of quality of research methodology.

**Data Analysis:** The binary logistic regression model:

$$\text{Logit}(P(Y=1)) = \beta_0 + \beta \times X + \epsilon$$

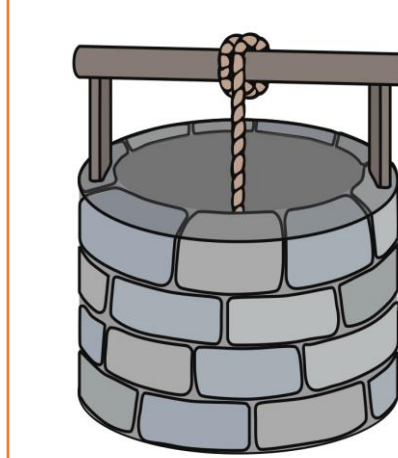
### Outcome Measurement

**Diarrhea:** Watery stool, self-reported, at least once within 14 days

**Stunting:** Length-for-age (LAZ) z score <-2.0. Standard deviations

**HIV disease progression:** V/L "<20", "<50", "<200", "undetectable", "not detected" (ND), "target not detected" (TND), "below the limit of" or "zero". Normal V/L= 20 to 75 log<sup>10</sup> copies/mL of the HIV per milliliter of blood. CD4+ count =500–1,500 cells/mm<sup>3</sup>

## 4.0 Results



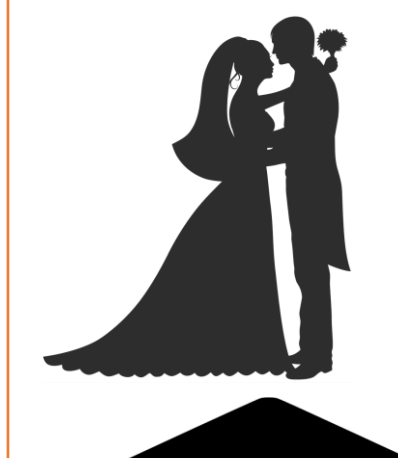
### Improved WaSH

practices significantly reduced diarrhea (IRR = 0.33, 95% CI 0.24–0.46, p < 0.0001)

**WaSH alone (without co-trimoxazole prophylaxis):** LPR = 0.47, 95% CI: 0.30–0.73, p < 0.001).



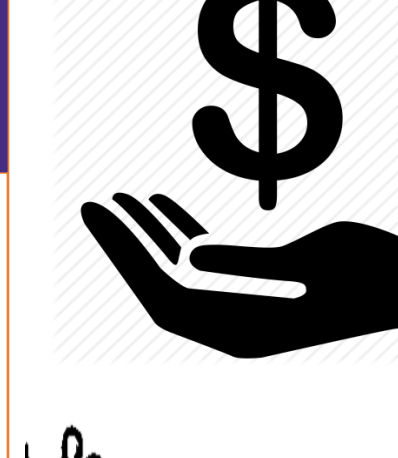
**Latrine Type** and sanitary quality had no significant influence (p > 0.05).



**Marital Status** (OR 2.8; 95% CI 1.1-6.9)



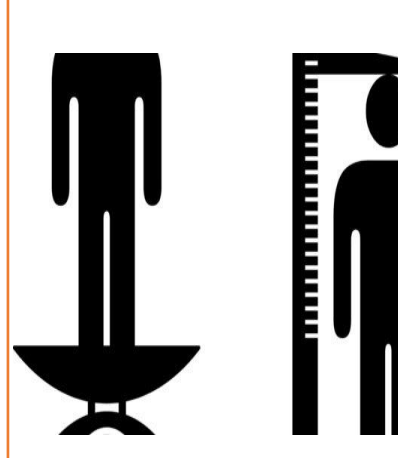
**Education** (OR 14.9; 95% CI 2.8-77.4)



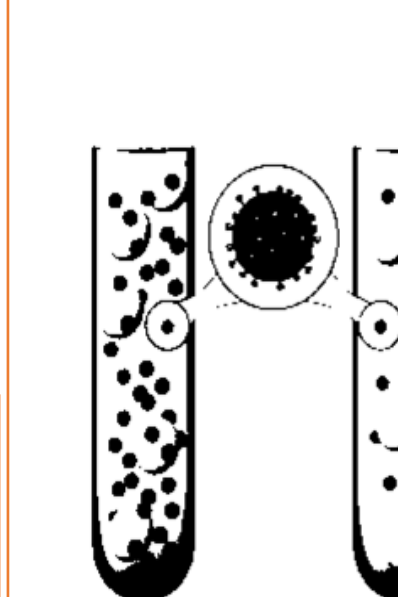
**Improved Income** (OR 0.1; 95% CI 0.1-0.3)



**Employment Status** (OR 2.5; 95% CI 1.1-5.6)



**Mean HT/Age Z-Score** was insignificant (0.01, 95% CI-0.16 to 0.18).



**Viral Load** : 5.01 log<sup>10</sup> vs. 3.41 log<sup>10</sup>, p < 0.001. The effect range: 5.28 log<sup>10</sup> copies/mL and 4.67 log<sup>10</sup> copies/mL, (p < 0.05) after treatment.

### CD4+ T-Lymphocyte Count

Insignificant difference between co-infection groups relative to those with HIV infection alone.

## 5.0 Discussion

- The combined effect of **co-trimoxazole/WaSH** is significantly higher than when each one of them were to be offered alone.
- Concurrent helminth infections** may damage immune control, resulting in escalating V/L
- Latrines protect from diarrhea **regardless of whether they are improved.**
- Better income, access to healthcare, WaSH, education and employment** are significant predictors of diarrhea. However, stunting has multifaceted causality and WaSH alone couldn't stimulate linear growth.
- The "Global strategy to combat helminths aligns with the SDG 6.1 and 6.2 on drinking water and sanitation. Helminths generally afflict the world's poorest households living in remote rural areas and urban slums (WHO, 2011). The diseases can be effectively controlled through sound WaSH interventions.

## 6.0 Recommendations

- Adoption of Low-cost Latrines-** a step towards the progressive realization of SDGs (3,6,10) as they could be attained using the most cost-effective means.
- Social Protection Schemes** to cushion HIV socioeconomic impact.
- Social Prescribing Model (Public/PVT Partnership)** to enhance access to non-clinical services.
- Differentiated Service Delivery Model** of care to integrate WaSH/HEI follow up with IMCI village clinics to combat sub-optimal retention in HIV care.
- Basic care packages** for HEI (water treatment, water vessel, water filters, anti-bacterial soap and oral rehydration salt).

