Causes of Mortality Among Persons Living With HIV in Thailand, 2007-2022

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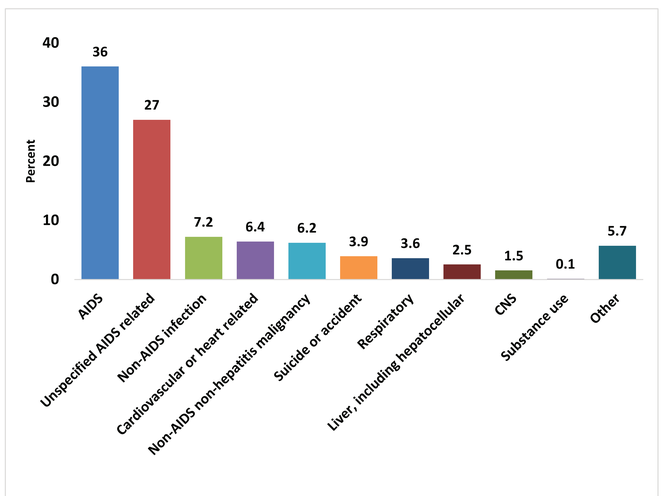
BACKGROUND

- Over 1,200 government and private healthcare facilities provide free HIV services under Universal Health Coverage (UHC) for >90% of persons living with HIV (PLHIV) in Thailand.
- The National AIDS Program (NAP) extracted death information from the National Death Registration System for all PLHIV since 2005.
- We analyzed mortality trends and causes among reported PLHIV from 2007 to 2022.

METHODS

- A retrospective analysis was conducted on People Living with HIV (PLHIV) aged ≥15 years, registered in the National AIDS Program (NAP) database as of January 31, 2023.
- Causes of death were categorized using a clinician-designed algorithm based on Thai HIV case surveillance definitions and WHO HIV clinical staging guidelines.
- A text clustering model was employed to automatically classify causes of death recorded between 2007 and 2022.
- A Cox proportional hazards regression model was applied to calculate cause-specific mortality rate ratios (MRR) across two-year intervals.
- The analysis was adjusted for the last reported CD4 category, age group at death, and time-period.

Figure 1: Causes of Death, Thailand, 2007 - 2022



AIDS-related causes accounted for the majority of deaths (36%) among PLHIV > 15 years.
A significant proportion had advanced disease at diagnosis, having a baseline CD4 count <100 cells/μL, and 30% dying before initiating treatment.
Higher mortality risks were associated with AIDS-related causes, unspecified AIDS-related deaths, and suicides/accidents.

Strengthening early case detection, rapid ART initiation, and advanced HIV disease services are critical to reducing AIDS-related mortality.

RESULTS

- Among 673,635 registered PLHIV ≥15 years, 162,051 (24%) died from various causes.
- The median age at HIV diagnosis was 35 years (IQR: 28-42 years), while it was slightly higher at 38 years (IQR: 31-46 years) for those who died.
- Mortality rates varied, from 9.5% (15,390) in 2007-2008 to 14% (22,736) in 2021-2022.
- Half of the deceased had a baseline CD4 count < 100 cells/μL and 30% (49,157) died before initiating treatment.
- The most common causes of death were AIDS (59,573 deaths; 36%), unspecified AIDS-related causes (44,369 deaths; 27%), and non-AIDS infections (11,918 deaths; 7%). (Figure 1)
- The proportion of AIDS-related deaths increased slightly from 32% (4,870) in 2007-2008 to 35% (7,962) in 2021-2022. (Figure 2)
- Using a Cox model, we found that AIDS-related mortality (adjusted MRR [aMRR]: 1.03, 95% CI: 1.02-1.04), unspecified AIDS-related mortality (aMRR: 1.05, 95% CI: 1.04-1.07) and deaths from suicide or accidents (aMRR: 1.07, 95% CI: 1.04-1.10) were associated with higher mortality risk compared to death from non-AIDS infections, after adjusting for factors such as CD4 count and age.
- Conversely, deaths from non-AIDS non-hepatitis malignancies (aMRR: 0.97, 95% CI: 0.95-0.99) and CNS-related causes (aMRR: 0.90, 95% CI: 0.86-0.94) were associated with a lower mortality risk. (Figure 3)

Figure 2: The proportion of Causes of Death across two-year intervals, Thailand, 2007 - 2022

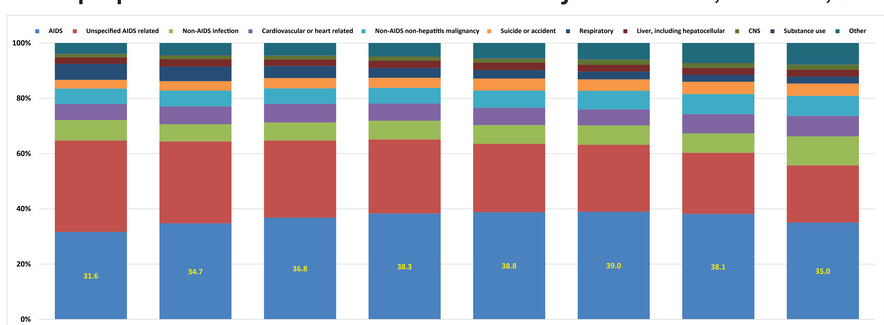
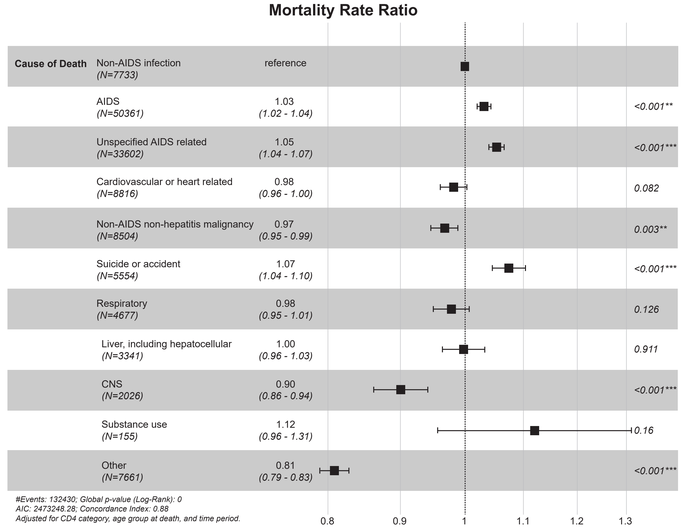


Figure 3: Cause-specific MRR across two-year intervals using Cox proportional hazards regression model, Thailand, 2007 - 2022



CONCLUSIONS

- AIDS-related causes accounted for the majority of deaths among PLHIV >15 years.
- Targeted interventions to strengthen early case detection and improve treatment initiation could help reduce AIDS-related deaths.
- Focus on ongoing monitoring of HIV-related mortality to identify risk factors and enhance patient outcomes.
- Implement integrated strategies to reduce mortality rates among PLHIV.

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