

# Influence of AIDS-defining events on PLWH hospitalization: implications for DRGs and length of stay. A retrospective administrative data analysis

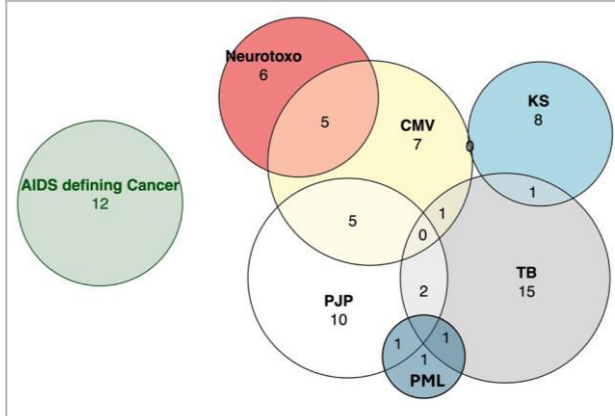
G. Cavazza<sup>1,2</sup>, N. B. Bana<sup>1,2</sup>, F. Peracchi<sup>1,2</sup>, E. D. Gennaro<sup>1,2</sup>, A. Mulè<sup>3</sup>, L. Denti<sup>4</sup>, C. Baiguera<sup>1</sup>, M. C. Moiola<sup>1</sup>, A. Raimondi<sup>1</sup>, M. Merli<sup>1</sup>, R. Rossotti<sup>1</sup>, M. Puoti<sup>1,2</sup>

## Introduction

- Despite the success of antiretroviral therapy<sup>1</sup>, HIV continues to significantly impact hospitalizations, particularly with AIDS-defining illnesses. Recently, the characteristics of people living with HIV (PLWH) requiring hospitalization have shifted, including an increase in haemato-oncologic diseases and the challenges posed by an aging HIV population<sup>2</sup>.
- Objective:** to understand the current landscape of HIV-related hospitalizations, focusing on the burden of AIDS on diagnostic-related groups (DRGs) and the duration of hospital stays.

- The opportunistic infections tended to cluster together, while AIDS-defining cancers were typically diagnosed alone.

**Figure 1 Venn diagram showing that it is common for PLWH to have multiple diagnoses of AIDS-defining infections, that tend to cluster together, while AIDS-defining cancers do not exhibit this clustering phenomenon**



## Study Design

- Retrospective analysis
- Period: January 2017 - February 2024
- Sample: 318 hospitalized PLWH

## Methods

### Data Collection

- Retrospective review of medical records for 318 hospitalized PLWH.
- Demographic data like gender, age, and admission department were collected from informatic records.
- Clinical data like length of hospital stay, primary diagnosis, comorbidities, and procedures, documented using International Classification of Diseases Ninth Revision (ICD-9) codes, were collected from the discharge letters.

### Statistical Analysis

- Descriptive statistics summarized demographic and clinical characteristics.
- Cochran-Armitage Test assessed temporal trends in AIDS diagnoses.
- Poisson Regression Models identified factors associated with higher DRG based reimbursements<sup>3</sup> and longer hospital stays. Adjustments were made for surgical admission, age, department changes, and multiple diagnoses.

## Results

- Most patients were male (78.3%) and admitted to Infectious Diseases (ID) department (40.57%).
- Leading diagnoses included:
  - not AIDS-defining infections (29.3%)
  - haemato-oncologic diseases (26.1%)
  - AIDS-defining illnesses (24.6%)

- Other co-pathologies, such as neurological, cardiovascular, and diabetic conditions accounted for a smaller proportion of hospitalizations.
- Incidence of new AIDS cases remained stable over the time (p=0.751).
- Factors associated with higher DRG based reimbursement included:
  - Surgical admission (IRR=1.711, 95% CI 1.705-1.717, p<0.001),
  - AIDS-defining illnesses (IRR=1.048, 95% CI 1.045-1.051 p<0.001),
  - older age (IRR=1.080 per decade, 95% CI 1.079-1.081 p<0.001),
- Factor associated with a lower DRG based reimbursement was being hospitalized in a non-surgical department.
- Factor associated with a longer hospital stay:
  - AIDS (IRR=1.582, 95% CI 1.487-1.684, p<0.001),
  - department changes (IRR=1.422, 95% CI 1.327-1.523, p<0.001)
  - having multiple ICD-9 listed diagnosis (IRR=1.333, 95% CI 1.302-1.364, P< 0.001).
- Factors associated with shorter stays were being hospitalized in a haemato-oncology (IRR=0.612, 95%CI 0.563-0.665, p<0.001) and surgery department (IRR=0.890, 95%CI 0.803-0.987, p=0.027).

**Table 1 Demographic and clinical features of study population**

	Overall (318)	ID (129)	Oncology (35)	Surgery (35)	Other (119)
Sex, male, n (%)	249 (78.3)	104 (80.6)	104 (80.6)	29 (82.9)	89 (74.8)
Age (years), median (IQR)	55.0 (44.8-61.1)	51.8 (41.5-58.3)	58.0 (55.9-64.2)	57.7 (52.1-62.2)	55.5 (45.9-60.8)
Length of admission (days), median (IQR)	11 (6-21)	12 (6-21)	9 (6-23)	9 (5-19)	11 (7-20)
Number of diseases cited within the ICD9 diagnoses list, median (IQR)	4 (3-5)	3 (3-4)	4 (4-5)	3 (2-4)	4 (3-5)
AIDS-defining illness (any) cited within the ICD9 diagnoses list, n (%)	78 (24.6)	44 (34.4)	13 (37.1)	1 (2.9)	20 (16.8)
Haemato-oncologic disease cited within the ICD9 diagnoses list, n (%)	83 (26.1)	20 (15.5)	35 (100)	7 (20.0)	21 (17.7)
Change of Department of admission during hospital stay, n (%)	42 (13.2)	10 (7.8%)	1 (2.9)	7 (20.0)	24 (20.2)
DRG-defined reimbursement (x1,000€), median (IQR)	7.5 (4.7-9.3)	9.2 (5.6-9.3)	6.7 (2.6-10.1)	6.6 (4.3-10.5)	5.6 (4.2-9.3)

## Conclusions

- HIV-related hospitalizations continue to strain healthcare systems, mainly due to infectious events or malignancies.
- AIDS and its comorbidities extend hospital stay and increase DRG based reimbursements.
- Departments like haemato-oncology or surgery tend to have shorter stays, likely due to scheduled admission.
- Tailored care strategies are crucial to adapt to evolving PLWH needs and optimize resource allocations.

## References

- Life expectancy of individuals on combination antiretroviral therapy in high-income countries: a collaborative analysis of 14 cohort studies. The Lancet. 2008 Jul;372(9635):293-9.
- Erlanson KM, Karris MY. HIV and Aging. Infectious Disease Clinics of North America. 2019 Sep;33(3):769-86.
- Cammarota S, Citarella A, Manzoli L, Flacco ME, Parruti G. Impact of comorbidity on the risk and cost of hospitalization in HIV-infected patients: real-world data from Abruzzo Region. CEOR. 2018 Jul;Volume 10:389-98.