

# HIV-Associated Wasting in the Era of Weight Gain

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## BACKGROUND

- HIV-associated wasting (HIVAW) is defined as progressive, involuntary weight loss with both fat and lean muscle tissue loss
- Though weight gain and obesity are on the rise among people with HIV (PWH)<sup>1,2</sup>, wasting and unintentional weight loss are still a concern for some, despite advancements in antiretroviral therapy (ART)
- The period prevalence of HIVAW in the United States (US) was reported in claims studies as 8% in 2005-2007 and 18% in 2012-2018<sup>3,4</sup>

## OBJECTIVE

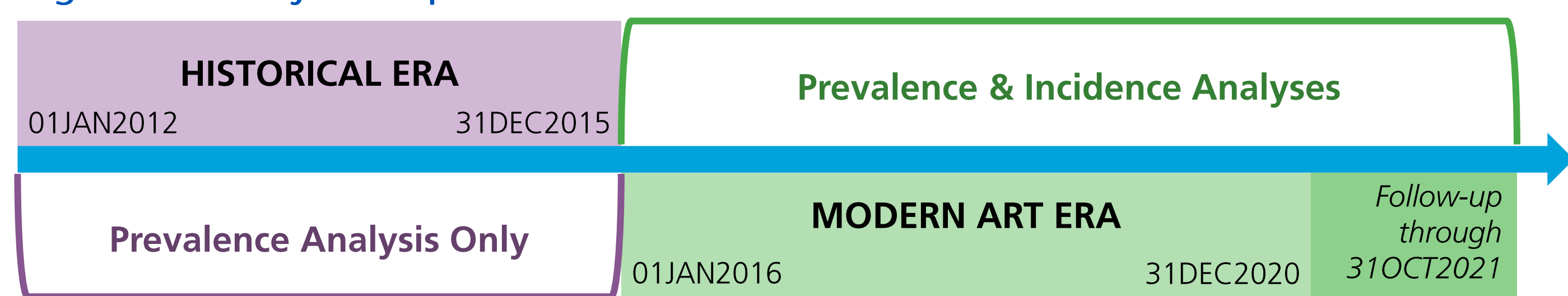
Assess the prevalence and incidence of HIVAW/low weight in the historical (2012-2015) and modern ART (2016-2020) eras in the United States.

## METHODS

### Study Population and Time Periods

- OPERA<sup>®</sup> observational cohort
  - Prospectively captured, routine clinical data from electronic health records
  - >140,000 PWH as of November 2021, representing ~13% of people living with diagnosed HIV infection in the US<sup>5</sup>
- Inclusion criteria for prevalence and incidence analyses
  - People with HIV (PWH)
  - 18 years of age or older
  - In care: ≥ 1 visit in OPERA<sup>®</sup> during the specified time period
- Additional inclusion criteria for incidence analyses
  - No malignancy (except basal cell carcinoma [BCC], squamous cell carcinoma [SCC] or *in situ* cancer) within 3 years of baseline
  - No AIDS-defining opportunistic infection (OI) within 12 months of baseline
  - No prior HIVAW/low weight
- Baseline: First date when eligibility criteria were met

Figure 1. Study time periods



### HIVAW/Low Weight

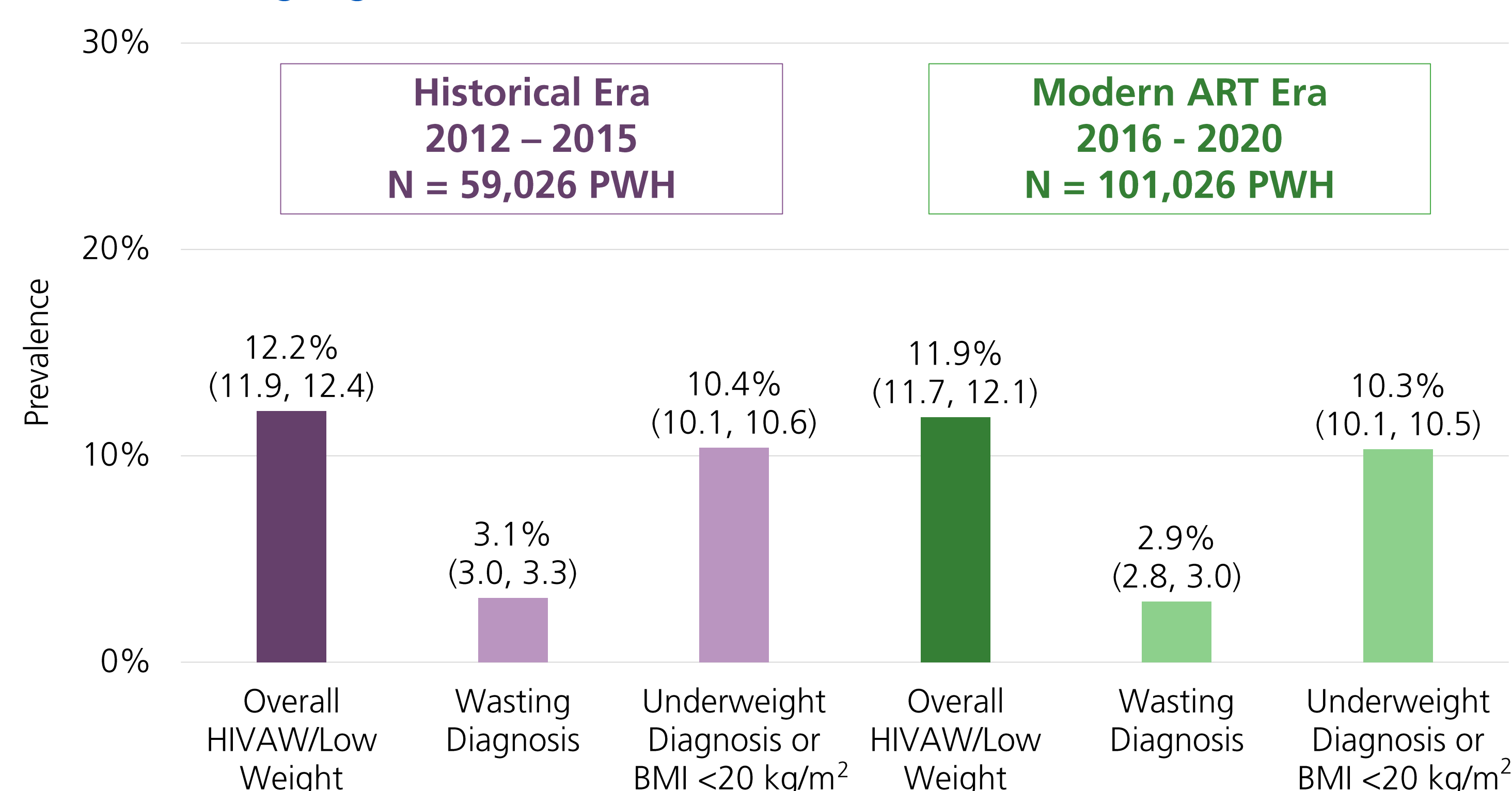
- Wasting or low body mass index (BMI)/underweight diagnosis (ICD codes, title search) or BMI < 20 kg/m<sup>2</sup> (vitals measurement)

### Statistical Analyses

- Prevalence: Proportion of the total eligible study population during specified time period that ever met the criteria for HIVAW/low weight
- Incidence analyses
  - Univariate Poisson regression to estimate the incidence rate (IR) of HIVAW/low weight and 95% confidence intervals (CI)
  - Censoring events
    - Incident malignancy (except BCC, SCC, or *in situ* cancer)
    - Incident AIDS-defining OI
    - Lost to follow-up (12 months without clinical contact)
    - Death
    - End of study (31OCT2021)

## RESULTS

Figure 2. Prevalence of HIVAW/low weight, overall<sup>a</sup> and by specific criteria<sup>b</sup>, in the era of weight gain



ART, antiretroviral therapy; BMI, body mass index; HIVAW, HIV-associated wasting; kg, kilograms; m, meters; PWH, people with HIV

<sup>a</sup> Included a wasting or low BMI/underweight diagnosis (ICD codes, title search) or BMI <20 kg/m<sup>2</sup> (dark bars)

<sup>b</sup> Wasting diagnosis (ICD codes, title search) is reported separately from low BMI/underweight diagnosis (ICD codes, title search) and BMI <20 kg/m<sup>2</sup> (lighter bars)

Table 1. Prevalence of HIVAW/low weight by payer type

Payer Type <sup>a</sup>	Historical Era % (95% CI)	Modern ART Era % (95% CI)
Medicaid	15.3 (14.7, 15.9)	14.9 (14.4, 15.4)
Medicare	14.7 (13.9, 15.5)	14.9 (14.2, 15.6)
Commercial Ins.	10.4 (10.0, 10.9)	10.7 (10.4, 11.0)
ADAP/Ryan White	11.8 (11.3, 12.3)	11.6 (11.2, 12.0)
Other	11.5 (10.3, 12.7)	10.7 (10.0, 11.5)
No Payer Info	11.5 (10.9, 12.1)	11.2 (10.7, 11.7)

ADAP, AIDS Drug Assistance Program; ART, antiretroviral therapy; CI, confidence interval; HIVAW, HIV-associated wasting; Ins., insurance

<sup>a</sup> Payer types are not mutually exclusive

Table 3. Incident HIVAW/low weight among 67,119 PWH in the modern ART era

Since Baseline	
Total person-years at risk	225,215
HIVAW/low weight, n (%)	4,962 (7)
Median (IQR) months to HIVAW/low weight	8.7 (1.4, 24.1)
Incidence rate, per 100 py (95% CI)	2.20 (2.14, 2.27)
Since HIV Diagnosis	
Total person-years at risk	749,868
HIVAW/low weight, n (%)	4,962 (7)
Median (IQR) months to HIVAW/low weight	64.3 (13.9, 174.3)
Incidence rate, per 100 py (95% CI)	0.66 (0.64, 0.68)

ART, antiretroviral therapy; CI, confidence interval; HIVAW, HIV-associated wasting; IQR, interquartile range; n, number; py, person-years

Table 4. Baseline demographic and clinical characteristics of 67,119 PWH in the modern ART era

	Incident HIVAW/low weight N = 4,962	No incident HIVAW/low weight N = 62,157
Median (IQR) age, years	40 (28, 53)	41 (31, 52)
Female sex, n (%)	926 (19)	11,389 (18)
Black race, n (%)	2,559 (52)	28,655 (46)
Hispanic ethnicity, n (%)	805 (16)	13,708 (22)
Ever on ART on or prior to baseline, n (%)	2,937 (59)	44,094 (71)
Ever on TAF on or prior to baseline, n (%)	715 (24)	12,437 (28)
Median (IQR) years from HIV diagnosis to ART initiation	3.5 (0.1, 12.4)	2.9 (0.1, 10.6)

ART, antiretroviral therapy; HIV, human immunodeficiency virus; HIVAW, HIV-associated wasting; IQR, interquartile range; n, number; TAF, tenofovir alafenamide

## DISCUSSION

- The prevalence of HIVAW/low weight was:
  - 12% in both the historical and modern ART eras; BMI vitals measurements < 20 kg/m<sup>2</sup> accounted for most cases (Figure 2)
  - Higher among PWH who reported Medicaid or Medicare as a payer (15%) compared to PWH who reported other payer types (10-12%), regardless of time period (Table 1); lower BMI is potentially associated with food insecurity, age, and disability
  - Stable at 7-8% between 2012 and 2019 but dropped to 5% in 2020 (Table 2); the small decrease may be an artifact of fewer healthcare interactions during the COVID-19 pandemic
- Among 67,119 PLWH without prior HIVAW/low weight in 2016-2020, 4,962 (7%) experienced HIVAW/low weight over follow-up (Table 3)
  - Incident HIVAW/low weight was experienced a median 5 years after HIV diagnosis (Table 3)
- PWH with incident HIVAW/low weight were more likely to be Black, less likely to be Hispanic or to have ever taken ART (specifically TAF, which has been linked to weight gain<sup>6</sup>), and experienced longer delays between HIV diagnosis and ART initiation than PWH without incident HIVAW/low weight (Table 4)

## KEY FINDINGS

- HIVAW/low weight remains a challenge for PWH and may be underappreciated by providers based on the large proportion of underweight PWH without a diagnosis of wasting.
- Increasing awareness of HIVAW could improve the care of affected individuals.

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