

# Weight gain associated with INSTI-containing regimens in treatment naïve patients is affected by multiple factors

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## Background

- Weight gain during antiretroviral therapy (ART), has been a metabolic concern in patients living with HIV (PLWH). Apart from categories of antiretrovirals used, disease status at diagnosis may also exert significant impact on weight change especially in late presenters.
- In this study, we investigated dependent factors of weight gain in Chinese PLWH.

## Methods

- A single-center retrospective observational study was conducted in adult PLWHs during Jun 2007 to Oct 2019. Patients' weight at baseline and over two years of ART were collected and analyzed in treatment-naïve individuals.
- Demographics and baseline clinical characteristics were compared among different ART regimens, particularly between RAL- and DTG-based regimens, using Pearson  $\chi^2$ , Wilcoxon rank-sum, or Kruskal-Wallis test as appropriate.
- Regression models adjusted for multiple factors were also conducted to check the dependent factors.

## Results

### 1. Baseline characteristics

Factor	All Regimens	NRTI-based Regimens	PI-based Regimens	INSTI-based Regimens	*P Value
Total, No. (%)	333	236	34	63	
Age at time of ART initiation, y, median (IQR)	42(34-50)	42(33-49)	44(34-52)	44(34-52)	0.34
Birth sex					0.007
Male	306	218	28	60	
Female	27	18	6	3	
Baseline CD4 T-cell count, cells/ $\mu$ L, median (IQR)	261(125-362)	247(128-344)	256(83-337)	317(109-440)	0.36
Baseline CD4/CD8 ratio, median(IQR)	0.32(0.15-0.45)	0.32(0.16-0.45)	0.32(0.12-0.48)	0.31(0.14-0.42)	0.73
Baseline log HIV RNA, copies/mL, median (IQR)	4.4(4.2-5.1)	4.5(4.2-5.1)	4.5(4.1-5.2)	4.3(2.8-5.4)	0.55
Baseline weight, kg, median (IQR)	67(59-74)	67(60-75)	61(56-68)	68(60-75)	0.009

Data are presented as No. (%), unless otherwise indicated.  
Abbreviations: ART, antiretroviral therapy; HIV, human immunodeficiency virus; INSTI, integrase strand transfer inhibitor; IQR, interquartile range;  
\*Comparing the difference in baseline characteristics by regimen class (INSTI-, NNRTI-, and PI-based regimens) with K-W test.

### 2. Determination of CD4+ T cell count and CD4/CD8 ratio grouping threshold

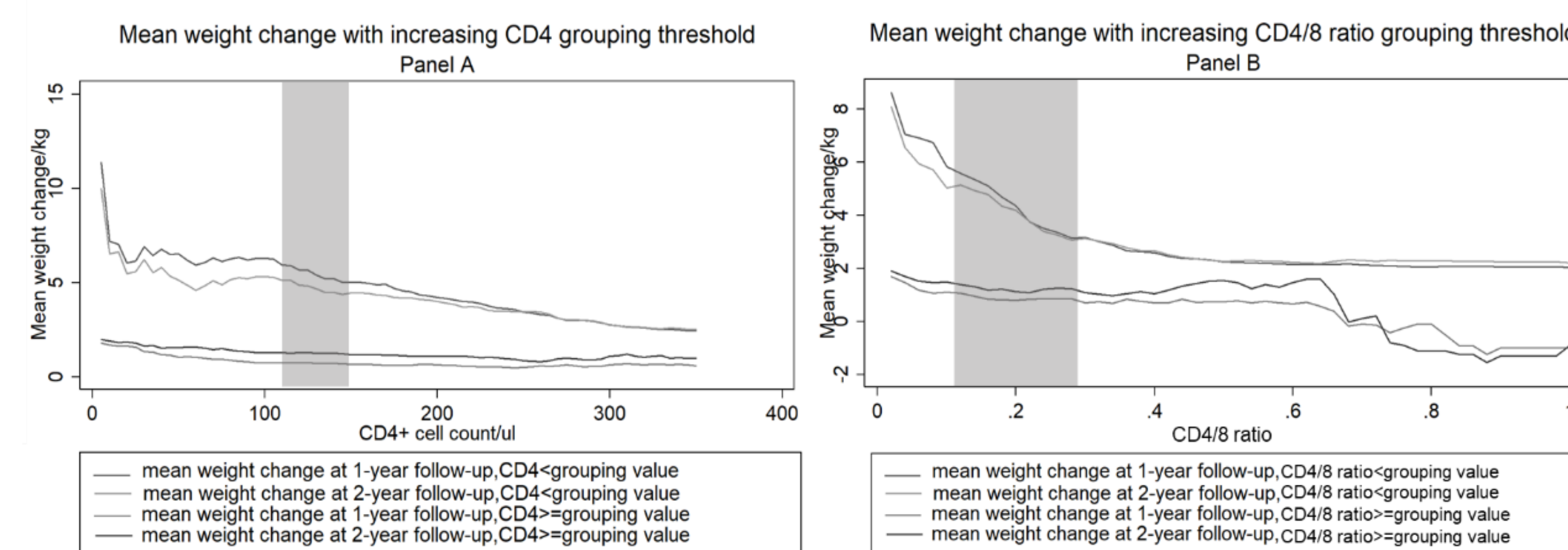


Figure 2. mean weight change at 1-year and 2-year follow-up in all treated naïve patients with increasing CD4+ count and CD4/8 ratio grouping threshold

### 3. Weight change in treatment-naïve patients stratified by clinical characteristics

Clinical characteristics	Mean (IQR) Change in Weight (kg) at 1-year followup	p value	Mean (IQR) Change in Weight (kg) at 2-year followup	p value
Baseline age				
Age $\leq$ 50 (n=232,229)	1.7(-1.4)	0.023	2.0(-1.4)	0.074
Age > 50 (n=76,75)	3.1(0-5)		3.5(0-7)	
Gender				
Female (n=27,27)	0.6(-1.3)	0.187	0.9(-2.4-4)	0.0855
Male (n=306,301)	2.1(-1.4)		2.4(-1-5)	
Baseline CD4 cell/(cells/mm <sup>3</sup> )				
CD4 $\leq$ 125 (n=85,84)	5.5(0-10)	<0.001	5.4(0-11)	<0.001
CD4 > 125 (n=246,242)	0.7(-2-3)		1.3(-1-4)	
Baseline CD4/CD8 ratio				
CD4/CD8 $\leq$ 0.15 (n=84,83)	5.3(0-9.75)	<0.001	5.3(1-11)	<0.001
CD4/CD8 > 0.15 (n=242,239)	0.8 (-2-3)		1.3(-1-4)	
Baseline VL (copies/ml)				
VL $\leq$ 10,000 (n=195,96)	1.5(-1-4)	0.0052	1.9(-1-4)	0.0403
VL > 10,000 (96,94)	3.2(-1-6)		3.7(0-7)	
Opportunistic infection when start ART				
Y (n=26,26)	8.2(4-12)	<0.001	8.0(3-13)	<0.001
N (n=307,302)	1.4(-1-4)		1.8(-1-4)	

### 4. Weight change in treated naïve patients associated with different regimens

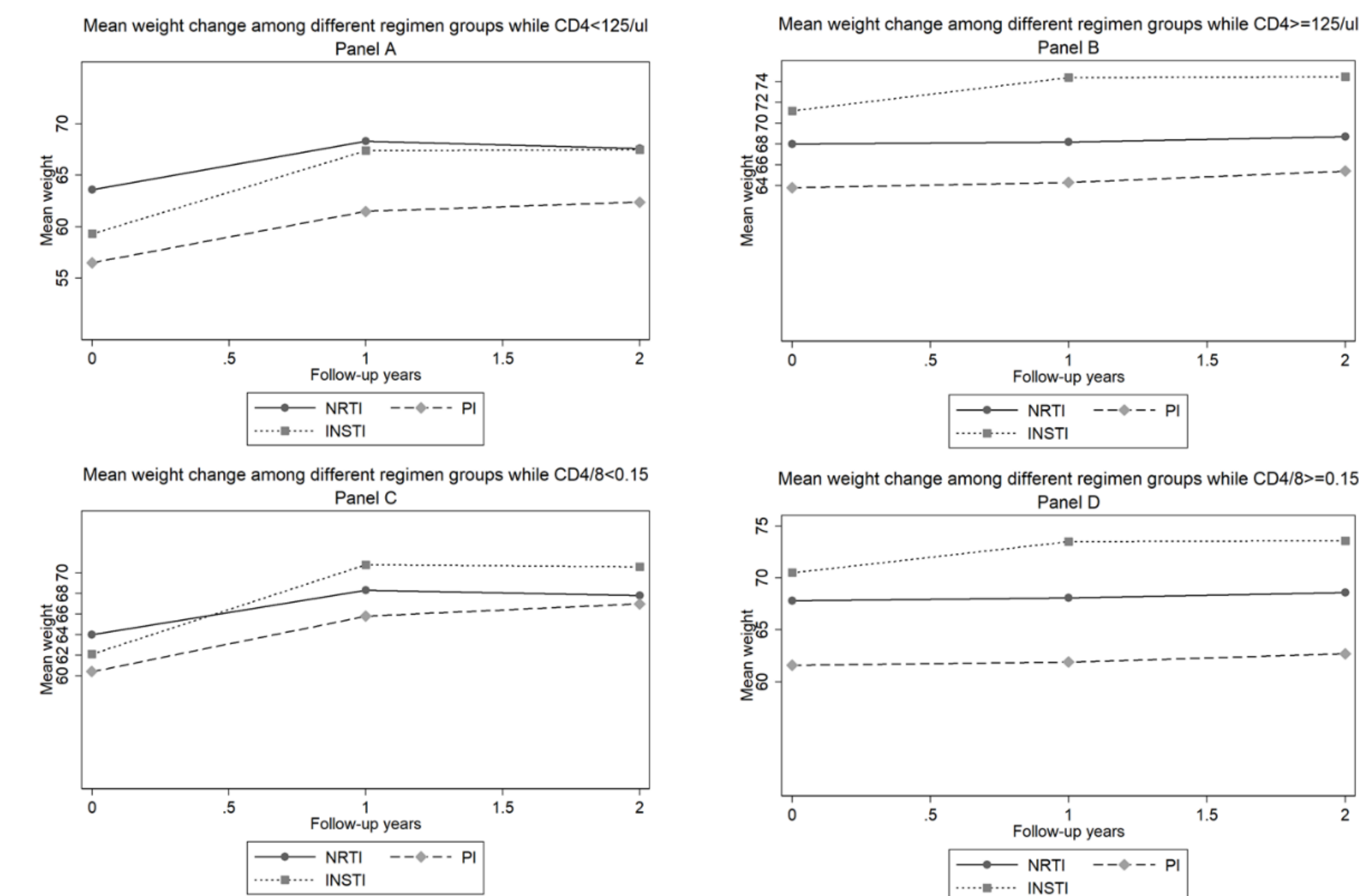


Figure 3. Weight gain associated with different regimens grouped by CD4+ cell count and CD4/8 ratio

## Discussion & Conclusions

- Weight gain associated with ART in treatment-naïve patients is affected by multiple factors. In addition to regimen-specific influences, important baseline factors should be taken into consideration when evaluating the weight gain associated with ART.
- Instead of using CD4+ T cell count of 200/ul as the grouping threshold, 125/ul for CD4 count or 0.15 for CD4/CD8 ratio might be better in differentiating patient weight change due to HIV-related wasting.
- Despite differences in baseline characteristics, INSTI-based regimens are still strongly associated with greater weight gain.

