

# PATTERNS OF ADIPOSITY AND GESTATIONAL WEIGHT GAIN IN PREGNANT SOUTH AFRICAN WOMEN LIVING WITH HIV

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DTG is not associated with gestational weight gain in pregnant South African women.

Patterns of adiposity specific to this population are not associated with HIV/DTG.

## BACKGROUND

- There are concerns that dolutegravir (DTG) may be associated with excess gestational weight gain (GWG) in pregnant women with HIV (WWH) but there are few data, including from Africa.

## METHODS

- The Obesogenic Origins of maternal and Child metabolic Health Involving Dolutegravir (ORCHID) study is evaluating metabolic outcomes of pregnant WWH receiving tenofovir+lamivudine+DTG (TLD) and HIV seronegative (HIV-) pregnant women seeking antenatal care at a primary healthcare facility in South Africa.
- For this analysis, we included 949 pregnant women (388 WWH, 561 HIV-) enrolled with gestational age (GA) <13 weeks (w) and age >16 years (y).
- Body composition was assessed using air displacement plethysmography (ADP) and serial standardised anthropometry including skinfold thicknesses to distinguish visceral versus subcutaneous fat distributions.
- Latent profile analysis (LPA) was used to identify adiposity patterns and examine whether these patterns varied by HIV status or duration of TLD use.
- We used linear regression to examine whether GWG(change in weight between first and third trimester in kg/week) varied by HIV/TLD.

## RESULTS

- At enrolment, median age was 27y [Interquartile range (IQR), 24-32]; GA 10w [8 -12]; BMI 30 kg/m<sup>2</sup> [25-35]; fat-mass index (FMI) 12 kg/m<sup>2</sup> [9-17]; centripetal fat ratio (CPFR) 52 [47-56]. In WWH, median duration of TLD use was 219 days [10 - 646] and 30% of women initiated TLD in pregnancy after enrolment (Table 1).

Table 1 - Characteristics of participants enrolled in the study and their gestational weight changes in the 3<sup>rd</sup> trimester.

Characteristic	HIV -ve (n = 561)	WWH (n = 388)	Total (n = 949)
Age - years	26 [23-30]	29[25-34]	27[24-32]
Gestational age - weeks	10 [8-12]	10 [8-11]	10 [8-12]
Nulliparous	273 (49%)	107 (28%)	380 (40%)
BMI - kg/m <sup>2</sup>	31 [26-36]	29 [25-34]	30 [25-35]
FMI - kg/m <sup>2</sup>	13 [9-17]	12 [9-16]	12 [9-17]
Centripetal fat ratio	52 [47-56]	52 [47-56]	52 [47-56]
Obesity phenotype			
Normal/moderate central fat	119 (21%)	108 (28%)	227 (24%)
Overweight/higher central fat	110 (20%)	78 (20%)	188 (28%)
Obese/moderate central fat	157 (28%)	108 (26%)	259 (27%)
Obese/lower central fat	30 (5%)	15 (5%)	45 (5%)
Morbid obese/higher central fat	145 (26%)	85 (22%)	230 (24%)
ART duration – years	--	4.2 [1.5-7.9]	4.2 [1.5-7.9]
TLD initiation			
In pregnancy after enrolment	--	117 (30%)	117 (30%)
Prior to pregnancy	--	271 (70%)	271 (70%)
Viral load < 50 copies/ml	--	286 (74%)	286 (74%)
Weight change from T1 to T3 - kg (n = 798)	7 [4-10]	5 [3-8]	6[3-9]
Rate of change from T1 to T3 - kg/week (n = 798)	0.3 [0.1-0.4]	0.2 [0.1-0.3]	0.3 [0.1-0.4]

All characteristics are presented as medians with interquartile ranges and frequencies with proportions

## RESULTS CONTINUED

- LPA identified five distinct adiposity patterns: weight/moderate central fat, (ii) overweight/higher central fat, (iii) obese/moderate central fat, (iv) obese/lower central fat, and (v) morbid obese/higher central fat.
- While women in pattern (i) were significantly younger, neither HIV status nor TLD duration were different across adiposity patterns after adjusting for maternal age.
- Among 798 women (84%) with third trimester GWG assessment, GWG patterns varied by HIV and BMI (Figure 1): WWH experienced 0.03 kg/week lower rate of GWG compared to HIV- women after adjustment for age, parity, education, GA and BMI at enrolment (95% CI: -0.06 to 0.01, p = 0.02). Restricted to WWH, GWG did not vary by TLD duration (not shown).

Figure 1- Median change in weight throughout gestation between the 1<sup>st</sup> and 3<sup>rd</sup> trimesters by HIV status and BMI categories. Light shaded streaks represent individual changes of weight for each participants.

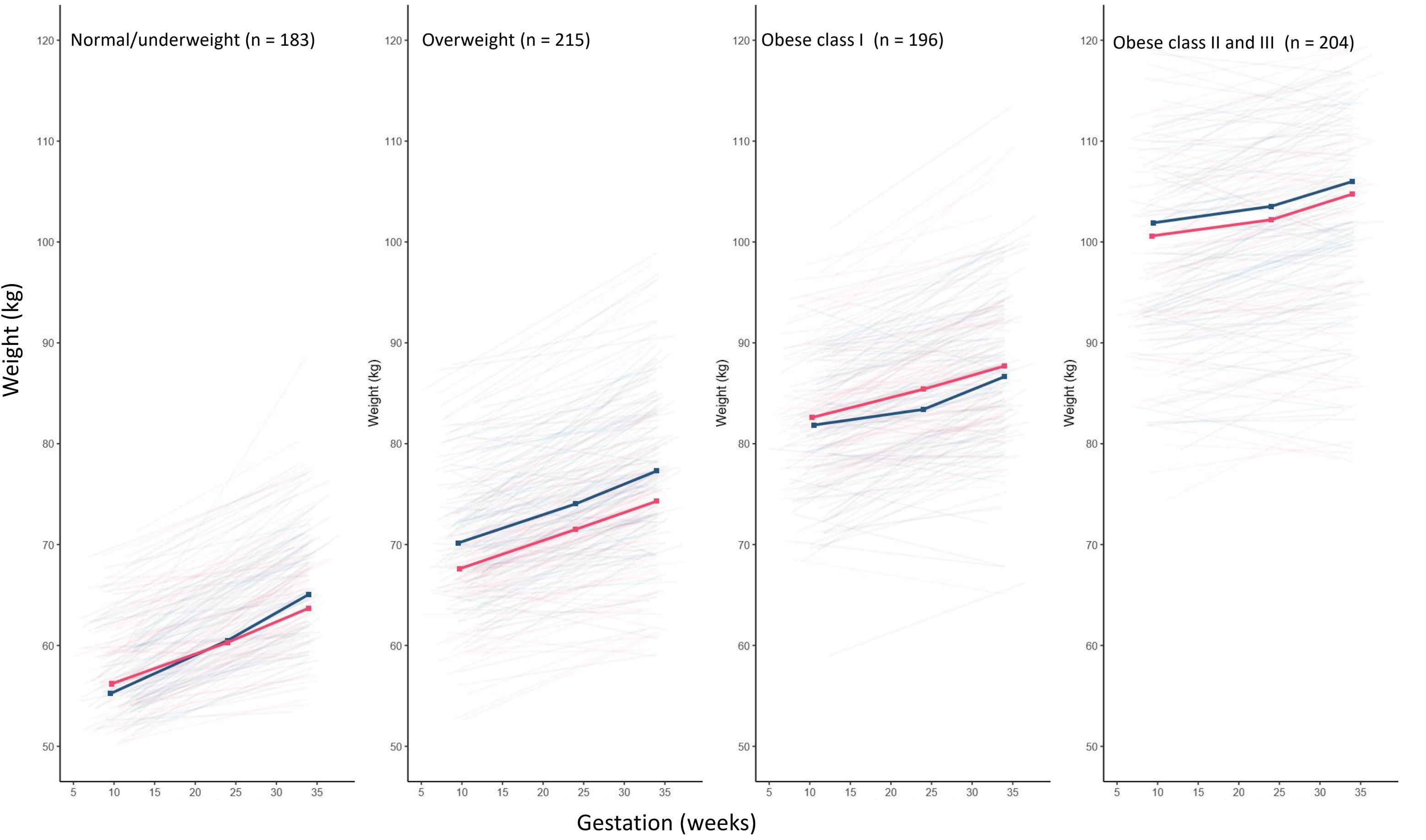


Table 2- Univariate and multivariate linear regression models showing the association between HIV and rate of weight change between 1<sup>st</sup> and 3<sup>rd</sup> trimesters.

Predictor	Univariate analysis	Multivariate analysis
HIV		
Negative	Ref	Ref
Positive	-0.04 (-0.07, -0.02)	-0.03 (-0.06, -0.01)
Age	-0.006 (-0.008, -0.003)	-0.001 (-0.004, -0.002)
Nulliparous		
No	Ref	Ref
Yes	0.08 (0.05, 0.11)	0.05 (0.02, 0.01)
Gestational age	0.02 (0.01, 0.03)	0.02 (0.01, 0.03)
BMI at enrolment	-0.009 (-0.011, -0.007)	-0.008 (-0.010, -0.007)
Education		
Beyond secondary	Ref	Ref
Secondary and below	-0.06 (-0.10,-0.01)	-0.06 (-0.10,-0.01)

Output presented as linear estimates with 95% confidence interval. All adjusting variables were included in this table.

## CONCLUSIONS

- These reassuring data suggest that DTG is not associated with GWG in this setting.
- While the patterns of adiposity identified are specific to this population, these are not associated with HIV/DTG.