

# DTG associated weight gain: real or perceived? Real world experiences from Newlands Clinic, Zimbabwe

Tinei Shamu<sup>1,2</sup>, Cleophas Chimbetete<sup>1</sup>, Justen Manasa<sup>3</sup>, Matthias Egger<sup>2,4</sup>, Nanina Anderegg<sup>2,4</sup>

<sup>1</sup>Newlands Clinic, 56 Enterprise Road, Newlands, Harare, Zimbabwe; <sup>2</sup>Institute of Social and Preventive Medicine, University of Bern, Bern, Switzerland; <sup>3</sup>Innovation Hub, University of Zimbabwe, Harare, Zimbabwe; <sup>4</sup>Centre for Infectious Disease Epidemiology and Research, University of Cape Town

## INTRODUCTION

- Dolutegravir (DTG) based regimens have been associated with weight gain among people living with HIV (PLWH) in clinical trials.
- Weight gain as an adverse effect can affect antiretroviral therapy (ART) adherence leading to suboptimal virologic suppression.
- Furthermore, excessive weight gain can have negative psychological and physiological effects on patients with the potential of mental and cardiovascular health effects (Figure 1).
- Weight gain among PLWH has been associated with return to health among previously sick patients.
- We compared real-world weight changes after starting or switching of treatment for DTG, efavirenz (EFV), and atazanavir (ATV/r) based regimens in a real-world setting where DTG use has been recently upscaled.

## METHODS

- We included adults ( $\geq 18$  years) starting or switching (defined as baseline) to EFV, ATV/r, or DTG between 2008 and 2021 at Newlands Clinic, Zimbabwe.
- We aggregated data:
  - by Month, sex, and treatment regimen (panel A in Figure 2 and Figure 3)
  - by Month, sex, treatment regimen and baseline BMI (panel B in Figure 2 and Figure 3)
- For each of the aggregated data cells we computed:
  - median absolute weight changes (compared to baseline weight)
  - median proportional weight changes (compared to baseline weight)
- We also computed for each data cell an "analysis-weight" that reflected the precision of the aggregated values in each data cell.
- We fitted weighted additive models to analyze temporal trends in absolute and proportional weight changes.
- We included covariates sex, treatment regimen and their interactions and smoothed temporal trends by sex and treatment regimen.
- We fitted the model overall (A) and stratified by baseline BMI group (B) (categorized as:  $< 18.5$  "Underweight",  $18.5-24.9$  "Normal range",  $\geq 25$  "Overweight or obese").

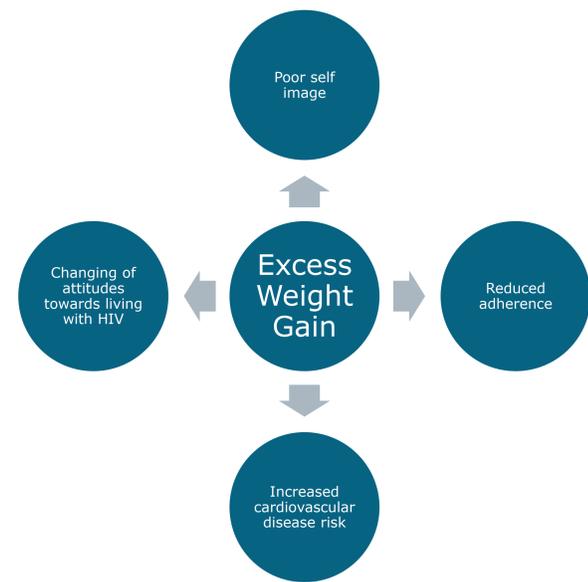


Figure 1. Potential effects of excess weight gain

## RESULTS

- We included 59,564 weight measurements of 7047 adults, with 5342, 1108, and 597 being on DTG, EFV, and ATV/r, respectively.
- Two years after baseline, estimated median weight (95% confidence interval) increased by 3.81kg (3.43-4.19), 2.01kg (1.58-2.44), and 1.92kg (1.52-2.31) for DTG, EFV and ATV/r, respectively in males and by 4.63kg (4.24-5.01), 1.21kg (0.81-1.61), and 1.61kg (1.23-2.00) for DTG, EFV and ATV/r, respectively in females (Figure 2).
- Overall, DTG-based regimens showed a strong, almost linear increase in weight over time, while weight gain plateaued with time for ATV/r and EFV-based regimens.
- For patients with low baseline BMI, increases in weight were similar among treatment groups, while patients with normal or high baseline BMI had substantially larger weight gains with DTG-based regimens.
- Females showed larger weight gains than males both in absolute and proportional value (Figure 2 and Figure 3).

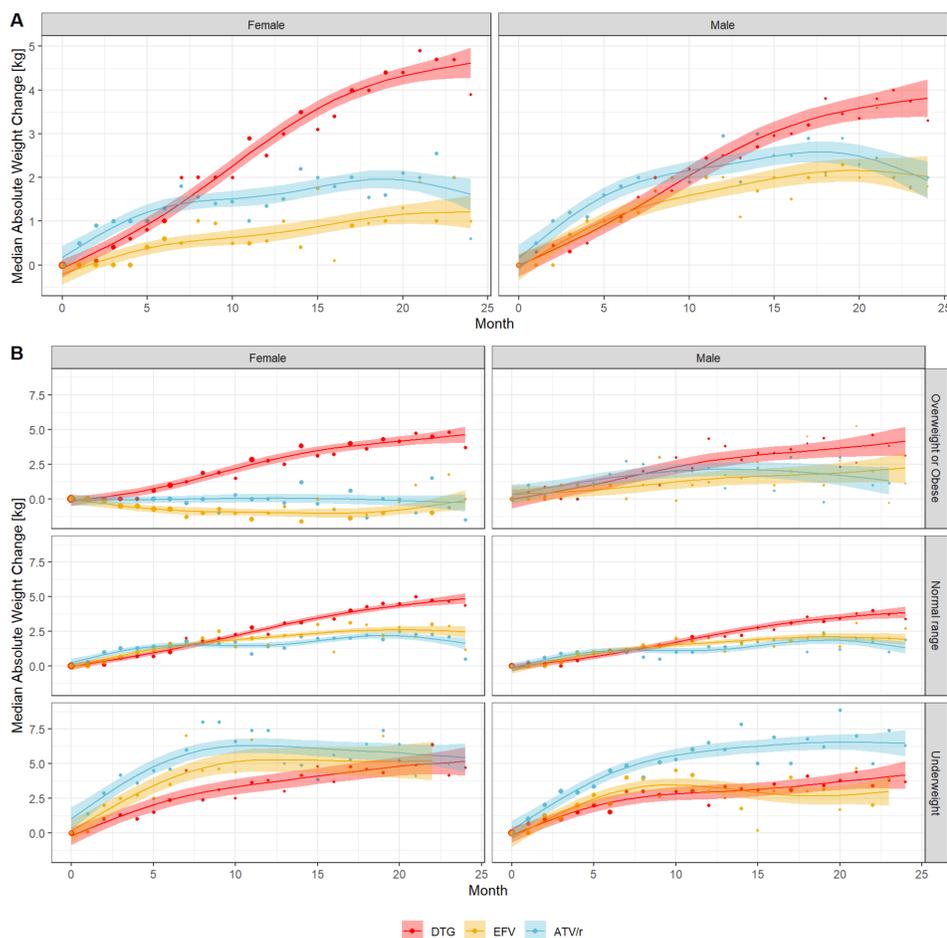


Figure 2. Estimated median absolute weight changes (compared to baseline weight) overall (A) and stratified by BMI baseline group (B). Lines and shaded areas show estimated median and 95% confidence intervals. The dots represent the observed medians in the data (with size proportional to the weights used in the analysis).

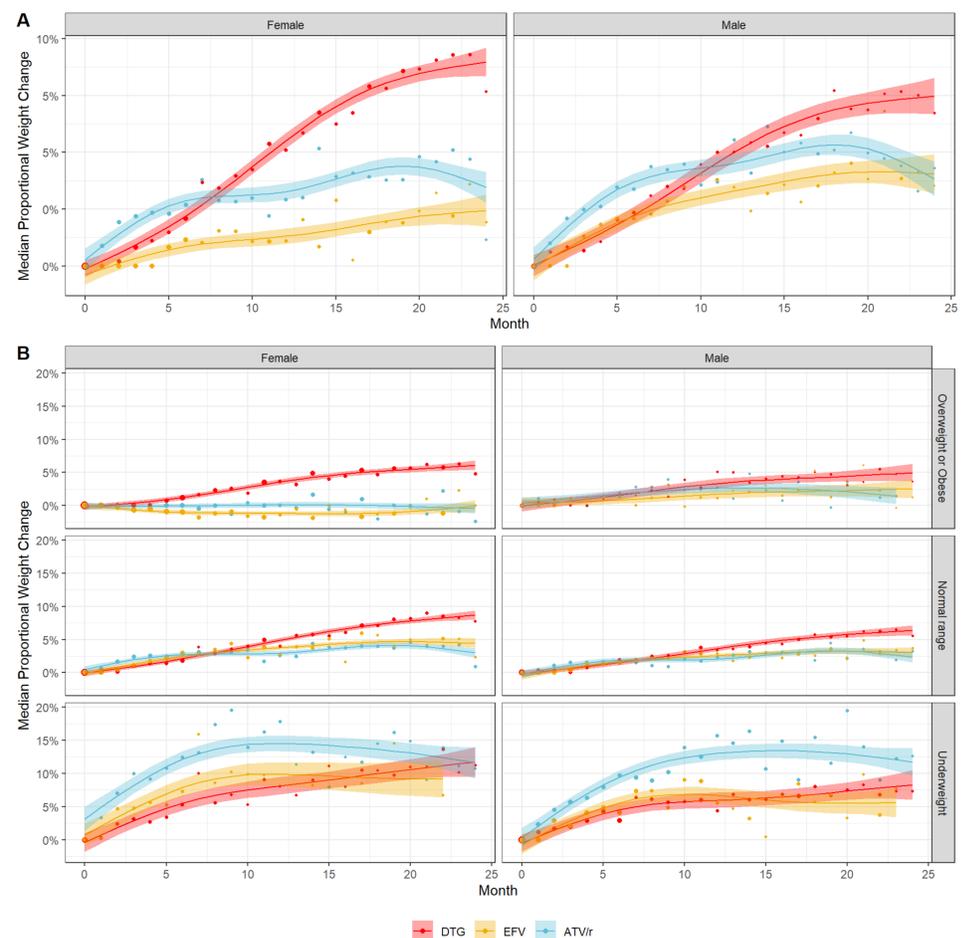


Figure 3. Estimated median proportional weight changes (compared to baseline weight) overall (A) and stratified by BMI baseline group (B). Lines and shaded areas show estimated median and 95% confidence intervals. The dots represent the observed proportions in the data (with size proportional to the weights used in the analysis).

## CONCLUSIONS

- Patients receiving DTG based regimens had a two- to four-fold weight gain compared to EFV and ATV/r over two years, with little evidence of plateauing of the trend among those in the DTG arm.
- Female patients had slightly higher weight gain compared to male patients in both absolute and median weight gain models
- Programs with PLWH receiving DTG based ART need to consider paying attention to the onward effects of weight gain in this population