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BODY MASS INDEX AND THE RISK OF SERIOUS NON-AIDS EVENTS (SNAEs)

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D:A:D

Kirby Institute

Background

- Increasing prevalence of being overweight or obese in the treated HIV-positive population (>50% in some settings) is possibly driven by antiretroviral therapy (ART) and life-style factors.

- High body mass index (BMI) (weight (kg)/ height(m^2)) in the general population has been associated with a range of adverse outcomes.

- On the other hand, low BMI/ being underweight is also associated with adverse outcomes, including mortality.

- In HIV-positive individuals, high BMI has been associated with the risk of diabetes.

- A detailed assessment of how BMI affects the risk of individual serious non-AIDS events (SNAEs) in HIV-positive individuals will help provide key data to clinicians and the patient community in optimizing management of this important modifiable risk factor.

Methods

Inclusion: D:A:D study participant → on ART → at least one BMI measurement available on/after ART initiation (baseline) → at least one year of further follow-up from study entry.

- Individuals with prior CVD, diabetes or cancer were excluded

Endpoints: Diabetes; cardiovascular disease (CVD) (composite of myocardial infarction/stroke/invasive cardiovascular procedures); non-AIDS-defining cancers (NADC); BMI-related NADCs (composite of cancers known to be associated with BMI in the general population: esophagus, pancreas, colon, rectum, breast, endometrium, kidney, thyroid and gallbladder); and all-cause mortality.

Statistics:

- BMI was time-updated lagged by 1 year (any BMI measurement being linked to an event precedes the given event by at least 1 year.
- Poisson regression models were used adjusted for key respective confounders for each outcome.

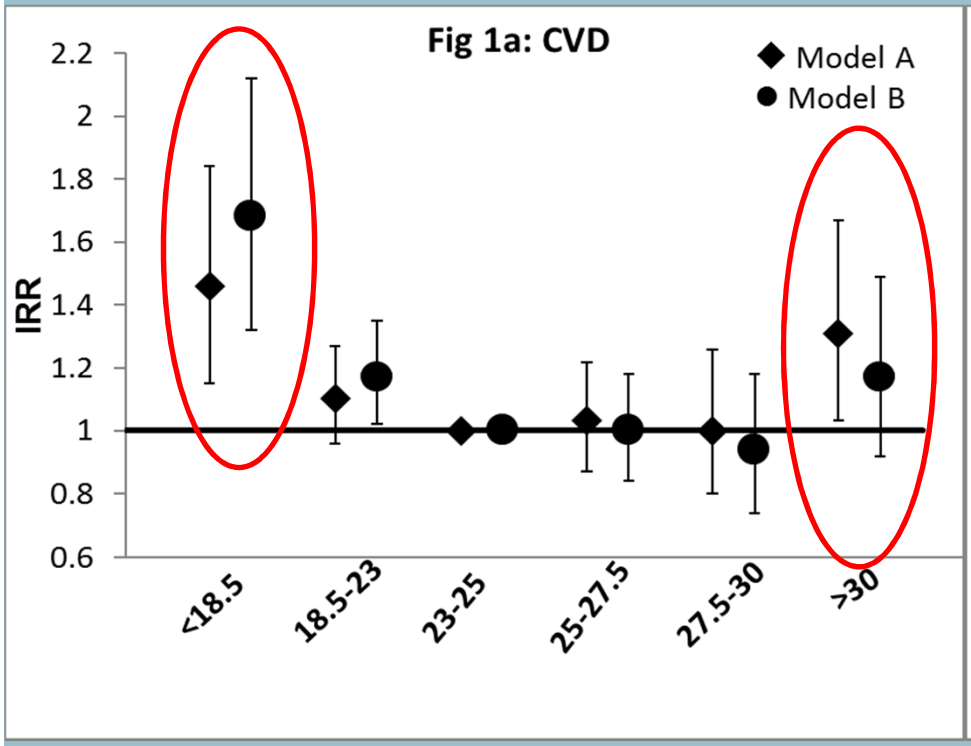
Results

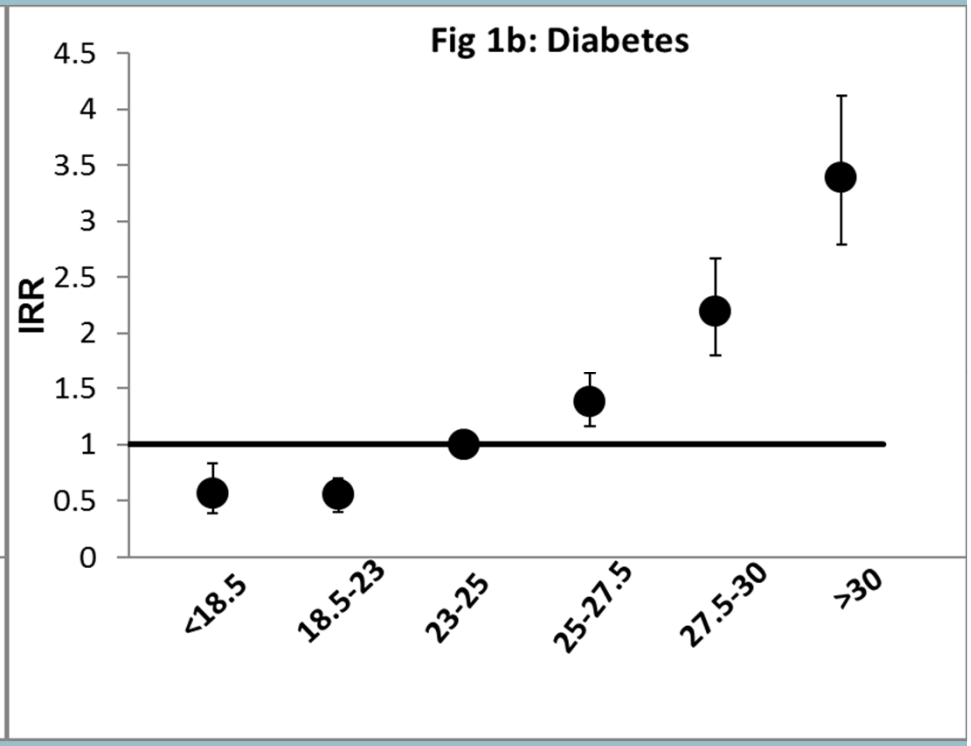
- 41,149 individuals with 295,147 person-years of follow-up (PYFU).
- Largely male (73%) with baseline mean age of 40 years and baseline median BMI of 23.3 (IQR: 21.2- 25.7). The median (IQR) time-gap between BMI measurements was 6 (4-9) months.
- Smoking appeared to be inversely related to the baseline BMI category.

Table: Number of SNAEs events and incidence rate per 1000 PYFU by BMI category

	Latest BMI (kg/m^2) category						
	<18.5	**18.5-23**	**23-25**	**25-27.5**	**27.5-30**	**>30**	**Overall**
CVD	97 (6.7)	578 (4.8)	298(4.6)	242(4.8)	96(4.4)	87(4.9)	1398 (4.8)
Diabetes	33 (2.3)	248 (2)	253 (4)	280 (5.6)	184 (8.5)	209 (12.2)	1207 (4.2)
NADC	95 (7.9)	510 (5.1)	223 (4)	167 (3.8)	82 (4.2)	66 (4.1)	1143 (3.9)
BMI-related NADC	12 (1)	75 (0.8)	32 (0.6)	31 (0.7)	13 (0.7)	21 (1.3)	184 (0.6)
All-cause mortality - males	260 (33.2)	1138 (13)	443 (8.4)	333 (8.1)	142 (8.7)	102 (10)	2418 (11.2)
All-cause mortality females	116 (16.7)	256 (7.4)	94 (7.2)	66 (6.2)	33 (5.4)	42 (5.3)	607 (7.6)

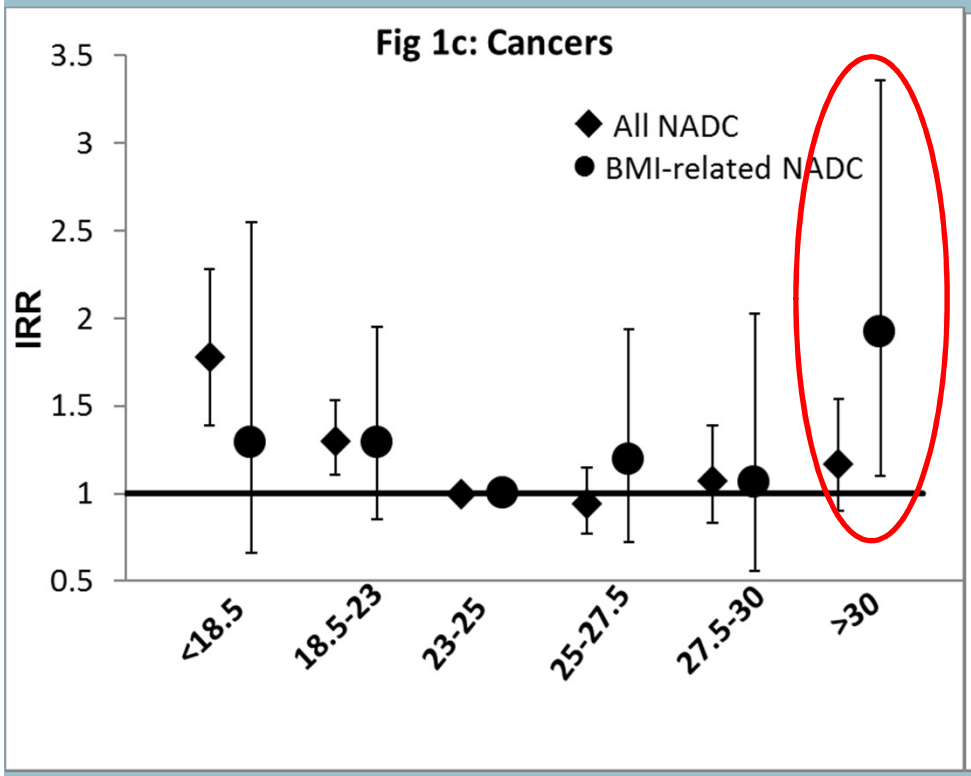
Results
Relative risk of each SNAE according to BMI

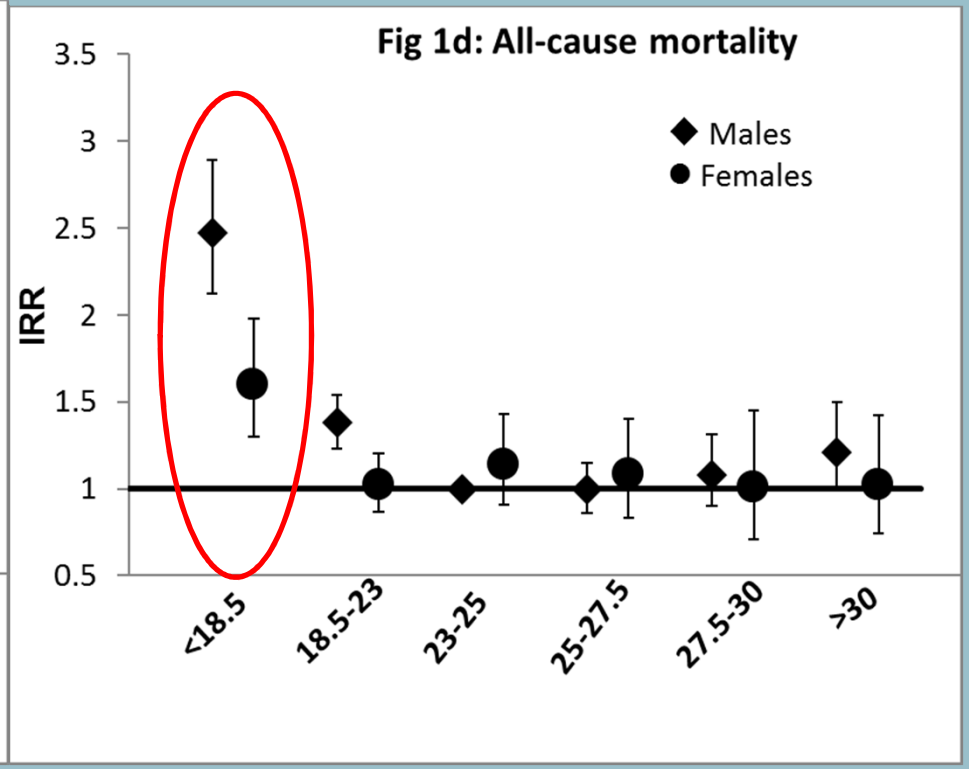




*Model B additionally adjusted for time-updated lipids, blood pressure and incident diabetes

Results
Relative risk of each SNAE according to BMI





Conclusions

- Low BMI preceding an event by at least 1-2 years was associated with an increased risk of CVD, cancers and all-cause mortality.
  - Residual confounding by smoking can not be excluded
- Risk of SNAEs (except diabetes) only start to increase at very high levels of BMI (>30), with minimal increased risk even at BMIs of 25-30.
- Data are limited by fewer study participants at extreme BMI levels, especially >30. Also limitations of BMI as a marker of body weight/fat.
- Future work should evaluate optimum BMI in the HIV-positive population and assess how short term and long term changes in BMI relate to the risk of SNAEs.

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