

STROBE checklist

Reporting checklist for cross-sectional studies, completed for: Dietary practices, obesity and CD4 count among adults with HIV on antiretroviral therapy in Johannesburg, South Africa: a secondary cross-sectional analysis of the ADVANCE trial.

STROBE checklist for cross-sectional studies: item locations

Section/Topic	No.	STROBE recommendation	Where reported in the manuscript
Title and abstract	1a	Indicate the study's design with a commonly used term in the title or the abstract.	Title: the phrase “a secondary cross-sectional analysis of the ADVANCE trial” appears in the title itself. Abstract, Methods sentence 1: “We performed a secondary cross-sectional analysis of food-intake assessments from the ADVANCE extension.”
	1b	Provide in the abstract an informative and balanced summary of what was done and what was found.	The structured Abstract (Background, Methods, Results, Conclusions paragraphs), including sample size, key adjusted estimates with 95% CIs and p values, and the explicit statement that no association survived false-discovery-rate correction.
Introduction	2	Explain the scientific background and rationale for the investigation being reported.	Background section, all four opening paragraphs: ART/NCD transition and obesity burden in South Africa (para 1), ADVANCE regimen-related weight gain (para 2), limited South African dietary evidence (para 3), and nutrition–immune function rationale (para 4).
	3	State specific objectives, including any prespecified hypotheses.	Background section, final paragraph, sentence beginning “The present study therefore aimed to describe dietary practices among adults with HIV... and to examine their cross-sectional associations with obesity and with CD4 count <500 cells/ μ L.”
Methods	4	Present key elements of study design early in the paper.	Methods, subsection “Study design, setting and parent trial”, first sentence: “This was a secondary cross-sectional analysis nested within the ADVANCE trial and its extension.”
	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection.	Methods, “Study design, setting and parent trial” (Johannesburg, South Africa; follow-up to week 192) and “Analytic population and index food-diary record” (index visits at weeks 120/144/168/192; index diary dates ranging 1 June 2020 to 18 November 2021).
	6a	Give the eligibility criteria, and the sources and methods of selection of participants.	Methods, “Analytic population and index food-diary record”: the raw export of 1393 records from 618 unique participants, and the index-record rule (earliest scheduled visit with a food-intake assessment, then earliest diary date within that visit).
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable.	Methods, “Outcomes and covariates” (obesity and CD4 <500 cells/ μ L definitions, BMI category cut-points) and “Dietary assessment and exposure definitions” (all 11 dietary-practice exposures and the a priori frequency-collapsing rule); covariates listed in “Outcomes and covariates” (age, sex, country of birth, employment, index visit, ART regimen).
Data sources/measurement	8*	For each variable of interest, give sources of data and details of methods	Methods, “Dietary assessment and exposure definitions”, first sentence: the food-intake assessment

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		of assessment (measurement). Describe comparability of assessment methods if there is more than one group.	was an interviewer-administered structured questionnaire completed by trial-site staff, captured in the trial's electronic case-report form. "Outcomes and covariates" describes BMI calculation from measured height/weight and CD4 count from the same visit record. A single assessment method was used for all participants, so no between-group comparability issue arises.
Bias	9	Describe any efforts to address potential sources of bias.	Methods, "Analytic population and index food-diary record": de-duplication to one index record per participant specifically to avoid pseudoreplication, with an explanation of what within-visit repeated records represent. Discussion, "Strengths and limitations": further discussion of residual bias sources (reverse causation for special diets, unmeasured baseline BMI/CD4).
Study size	10	Explain how the study size was arrived at.	Methods, "Statistical analysis": "No a priori sample-size calculation was performed because the analytic sample comprised all unique participants represented in the supplied food-diary export."
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why.	Methods, "Outcomes and covariates": age modelled per 10-year increase. "Dietary assessment and exposure definitions": a priori collapsing of frequency responses into <1/week, 1–3/week and ≥4/week "to reduce sparse cells and unstable estimates," with the exact category composition and the pap-frequency edge-case rule specified.
Statistical methods	12a	Describe all statistical methods, including those used to control for confounding.	Methods, "Statistical analysis": separate logistic regression models per exposure for each outcome, adjusted a priori for age, sex, country of birth, employment, index visit and ART regimen (regimen omitted from its own model).
	12b	Describe any methods used to examine subgroups and interactions.	Methods, "Statistical analysis", final listed sensitivity analysis: likelihood-ratio tests of exposure-by-sex interaction across all 18 contrasts for both outcomes (detailed results in Discussion and Additional files 2–3: Tables S2–S3).
	12c	Explain how missing data were addressed.	Methods, "Statistical analysis": "Analyses used complete cases; model sample size was 614 for most comparisons and 613 for pap frequency." Table 1 and Table 2 report non-missing n for every variable.
	12d	If applicable, describe analytical methods taking account of sampling strategy.	Not applicable and not separately addressed: the analytic sample comprised all unique participants in the supplied export rather than a complex probability or stratified sample, so no sampling-weight adjustment was required.
	12e	Describe any sensitivity analyses.	Methods, "Statistical analysis", final two sentences: continuous-CD4 linear-regression sensitivity analysis (Additional file 1: Table S1) and the exposure-by-sex interaction analysis (Additional files 2–3: Tables S2–S3).

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Results	13a	Report numbers of individuals at each stage of study, e.g. numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed.	Methods, “Analytic population and index food-diary record”: 1393 records from 618 unique participants, reduced to 618 index records, broken down by index visit (362 at week 120/144, 222 at week 168, 34 at week 192). Results, “Participant characteristics” confirms the analytic sample of 618.
	13b	Give reasons for non-participation at each stage.	Not applicable in the form used for primary recruitment studies: this is a secondary analysis of an existing export rather than a new enrolment process, so there was no separate non-participation stage to report beyond the exclusions already described under complete-case analysis (item 12c).
	13c	Consider use of a flow diagram.	No flow diagram was used; the participant flow from raw export to analytic sample is instead described narratively in “Analytic population and index food-diary record” (see item 13a).
Descriptive data	14a	Give characteristics of study participants (e.g. demographic, clinical, social) and information on exposures and potential confounders.	Table 1 (demographic, clinical and social characteristics) and Table 2 (dietary-practice exposures), with narrative summaries in Results, “Participant characteristics” and “Dietary practices.”
	14b	Indicate number of participants with missing data for each variable of interest.	Table 1 and Table 2 report a non-missing n for every characteristic and dietary practice (e.g. 614 for employment, 616 for education, 617 for pap frequency).
Outcome data	15*	Report numbers of outcome events or summary measures.	Results, “Participant characteristics”: 171 (27.7%) with obesity and 252 (40.8%) with CD4 <500 cells/μL; also reported in Table 1.
Main results	16a	Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g. 95% CI). Make clear which confounders were adjusted for and why they were included.	Tables 3 and 4 report adjusted odds ratios with 95% CIs and p values for all 18 contrasts per outcome; the adjustment set and rationale are given in Methods, “Outcomes and covariates” and “Statistical analysis.” Only adjusted (not separate unadjusted) estimates are reported.
	16b	Report category boundaries when continuous variables were categorized.	Methods, “Dietary assessment and exposure definitions” (frequency category boundaries) and “Outcomes and covariates” (BMI category cut-points: <18.5, 18.5–24.9, 25.0–29.9, ≥30.0 kg/m ²); repeated in the footnotes to Tables 1 and 2.
	16c	If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period.	Not undertaken: results are reported as adjusted odds ratios from cross-sectional logistic regression rather than as time-based relative risks, so translation to a time-period absolute risk was not applicable.
Other analyses	17	Report other analyses done, e.g. analyses of subgroups and interactions, and sensitivity analyses.	Results, “Associations with CD4 count below 500 cells/μL” (continuous-CD4 sensitivity analysis) and Discussion (sex-by-exposure interaction analysis), with full results in Additional files 1–3 (Tables S1–S3).
Discussion	18	Summarise key results with reference to study objectives.	Discussion, opening two paragraphs, beginning “In this secondary analysis of adults receiving long-term ART in the ADVANCE extension, obesity was common...”
	19	Discuss limitations of the study, taking into account sources of potential bias or	Discussion, “Strengths and limitations” subsection: the eight numbered limitations (cross-sectional

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		imprecision. Discuss both direction and magnitude of any potential bias.	design/reverse causation, self-reported diet, unmeasured confounders, sparse categories, repeated-record de-duplication, complete-case exclusions, unavailable baseline BMI/CD4, and underpowered sex-interaction tests).
	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence.	Discussion, throughout: e.g. the special-diet finding is discussed as likely reverse causation; the fruit finding is described as a non-monotonic pattern that “argues against a simple protective interpretation”; the regimen–CD4 finding is described as “best regarded as a chance-compatible exploratory signal.” Findings are also compared with prior South African cohort studies [8–12].
	21	Discuss the generalisability (external validity) of the study results.	Discussion, final sentence of “Strengths and limitations”: “the extension population represents participants retained in a clinical trial over prolonged ART follow up and may not be representative of all people with HIV in South Africa.”
Other information	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based.	Declarations, “Funding”: “The ADVANCE trial was supported by the U.S. Agency for International Development, Unitaaid and the South African Medical Research Council; investigational drugs were donated by Gilead Sciences and ViiV Healthcare.” No separate funding was received for this secondary analysis.

Checklist items follow the STROBE Statement checklist for cross-sectional studies (von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP, for the STROBE Initiative. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Lancet*. 2007;370(9596):1453–1457), available at www.strobe-statement.org. *Item 8 and item 15 carry an asterisk in the official checklist, indicating that the information should be given separately for exposed and unexposed groups where applicable; a single assessment method was used for all participants in this study. Locations refer to manuscript section headings and, where useful, the opening words of the relevant sentence, rather than to page numbers, since pagination can change during production and typesetting.