

# South Africa - Misreporting contraceptive use and the association of peak study progestin levels with weight and BMI among women randomized to the progestin-only injectable contraceptives DMPA-IM and NET-EN

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## Overview

### Identification

ID NUMBER

Misreportingcontraceptiveuse

### Overview

#### ABSTRACT

Progestin-only injectable contraceptives, mainly depo-medroxyprogesterone acetate intramuscular (DMPA-IM), are the most widely used contraceptive methods in sub-Saharan Africa. Insufficient robust data on their relative side-effects and serum concentrations limit understanding of reported outcomes in contraception trials.

The WHICH clinical trial randomized HIV-negative women to DMPA-IM (n=262) or norethisterone enanthate (NET-EN) (n=259) at two South African sites between 2018-2019. We measured serum concentrations of study and non-study progestins at initiation (D0) and peak serum levels, one week after the 24-week injection [25 weeks (25W)], (n=435) and investigated associations between study progestin levels, and BMI and weight of participants.

Peak median serum concentrations were 6.59 (IQR 4.80; 8.70) nM for MPA (n=161) and 13.6 (IQR 9.01; 19.0) nM for NET (n=155). MPA was the most commonly quantifiable non-study progestin at D0 in both arms (54%) and at 25W in the NET-EN arm (27%), followed by NET at D0 in both arms (29%) and at 25W in the DMPA-IM arm (19%). Levonorgestrel was quantifiable in both arms [D0 (6.9%); 25W (3.4%)], while other progestins were quantifiable in = 14 participants. Significant negative time-varying associations were detected between MPA and NET concentrations and weight and BMI in both contraceptive arms and a significant increase was detected for peak serum progestin concentrations for normal weight versus obese women.

Contraceptive-related reported outcomes are likely confounded by MPA, more so than NET, with reported DMPA-IM effects likely underestimated, at sites where DMPA-IM is widely used, due to misreporting of contraceptive use before and during trials, and 'tail' effects of DMPA-IM use more than six months before trial enrolment. Peak serum levels of MPA and NET are negatively associated with BMI and weight, suggesting another source of variability between trial outcomes and a potential increase in side-effects for normal weight versus overweight and obese women.

The clinical trial was registered with the Pan African Clinical Trials Registry (PACTR 202009758229976).

### Producers and Sponsors

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## Sampling

No content available

## Questionnaires

No content available

## Data Collection

## Data Processing

No content available

## Data Appraisal

No content available



## File Description

## Variable List

## data

Content

Cases 435

Variable(s) 38

Structure Type:  
Keys: ()

Version

Producer

Missing Data

## Variables

| ID  | NAME                     | LABEL                    | TYPE     | FORMAT    | QUESTION |
|-----|--------------------------|--------------------------|----------|-----------|----------|
| V1  | ID                       | ID                       | contin   | numeric   |          |
| V2  | Site                     | Site                     | discrete | character |          |
| V3  | mITT_arm                 | mITT_arm                 | discrete | character |          |
| V4  | PP1_arm                  | PP1_arm                  | discrete | character |          |
| V5  | PP2_arm                  | PP2_arm                  | discrete | character |          |
| V6  | Age                      | Age                      | contin   | numeric   |          |
| V7  | Ethnicity                | Ethnicity                | discrete | character |          |
| V8  | DMPA                     | DMPA                     | discrete | character |          |
| V9  | NETEN                    | NETEN                    | discrete | character |          |
| V10 | D0_Weight                | D0_Weight                | contin   | numeric   |          |
| V11 | D0_BMI                   | D0_BMI                   | contin   | numeric   |          |
| V12 | W_Weight                 | 25W_Weight               | contin   | numeric   |          |
| V13 | W_BMI                    | 25W_BMI                  | contin   | numeric   |          |
| V14 | Days_since_24W_injection | Days_since_24W_injection | contin   | numeric   |          |
| V15 | Un_D0_MPA                | Un_D0_MPA                | contin   | numeric   |          |
| V16 | Un_D0_NET                | Un_D0_NET                | contin   | numeric   |          |
| V17 | Un_D0_LNG                | Un_D0_LNG                | contin   | numeric   |          |
| V18 | Un_D0_ETG                | Un_D0_ETG                | contin   | numeric   |          |
| V19 | Un_D0_NES                | Un_D0_NES                | contin   | numeric   |          |
| V20 | Un_D0_GES                | Un_D0_GES                | contin   | numeric   |          |
| V21 | Un_25W_MPA               | Un_25W_MPA               | contin   | numeric   |          |
| V22 | Un_25W_NET               | Un_25W_NET               | contin   | numeric   |          |
| V23 | Un_25W_LNG               | Un_25W_LNG               | contin   | numeric   |          |
| V24 | Un_25W_ETG               | Un_25W_ETG               | contin   | numeric   |          |
| V25 | Un_25W_NES               | Un_25W_NES               | contin   | numeric   |          |
| V26 | Un_25W_GES               | Un_25W_GES               | contin   | numeric   |          |
| V27 | Im_D0_MPA                | Im_D0_MPA                | contin   | numeric   |          |
| V28 | Im_D0_NET                | Im_D0_NET                | contin   | numeric   |          |

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|     |            |            |        |         |
|-----|------------|------------|--------|---------|
| V29 | Im_D0_LNG  | Im_D0_LNG  | contin | numeric |
| V30 | Im_D0_ETG  | Im_D0_ETG  | contin | numeric |
| V31 | Im_D0_NES  | Im_D0_NES  | contin | numeric |
| V32 | Im_D0_GES  | Im_D0_GES  | contin | numeric |
| V33 | Im_25W_MPA | Im_25W_MPA | contin | numeric |
| V34 | Im_25W_NET | Im_25W_NET | contin | numeric |
| V35 | Im_25W_LNG | Im_25W_LNG | contin | numeric |
| V36 | Im_25W_ETG | Im_25W_ETG | contin | numeric |
| V37 | Im_25W_NES | Im_25W_NES | contin | numeric |
| V38 | Im_25W_GES | Im_25W_GES | contin | numeric |



## ID (ID)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 0  
Range: 1-435

Valid cases: 435  
Invalid: 0  
Minimum: 1  
Maximum: 435  
Mean: 218  
Standard deviation: 125.7

## Site (Site)

File: data

### Overview

Type: Discrete  
Format: character  
Width: 4

Valid cases: 435  
Invalid: 0

## mITT\_arm (mITT\_arm)

File: data

### Overview

Type: Discrete  
Format: character  
Width: 7

Valid cases: 435  
Invalid: 0

## PP1\_arm (PP1\_arm)

File: data

### Overview

Type: Discrete  
Format: character  
Width: 33

Valid cases: 435  
Invalid: 0

## PP2\_arm (PP2\_arm)

File: data

### Overview

Type: Discrete  
Format: character  
Width: 33

Valid cases: 435  
Invalid: 0

## Age (Age)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 0  
Range: 18-39

Valid cases: 435  
Invalid: 0  
Minimum: 18  
Maximum: 39  
Mean: 25  
Standard deviation: 4.7

## Ethnicity (Ethnicity)

File: data

### Overview

Type: Discrete  
Format: character  
Width: 19

Valid cases: 435  
Invalid: 0

## DMPA (DMPA)

File: data

### Overview

Type: Discrete  
Format: character  
Width: 3

Valid cases: 435  
Invalid: 0

## NETEN (NETEN)

File: data

### Overview

Type: Discrete  
Format: character  
Width: 3

Valid cases: 435  
Invalid: 0

## D0\_Weight (D0\_Weight)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 0  
Range: 37-165

Valid cases: 434  
Invalid: 1  
Minimum: 37  
Maximum: 165  
Mean: 75  
Standard deviation: 20.2

## D0\_BMI (D0\_BMI)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 0  
Range: 16-63

Valid cases: 433  
Invalid: 2  
Minimum: 16  
Maximum: 63  
Mean: 29.8  
Standard deviation: 7.8

## 25W\_Weight (W\_Weight)

File: data

### Overview

|                  |                          |
|------------------|--------------------------|
| Type: Continuous | Valid cases: 434         |
| Format: numeric  | Invalid: 1               |
| Decimals: 0      | Minimum: 38              |
| Range: 38-148    | Maximum: 148             |
|                  | Mean: 75.9               |
|                  | Standard deviation: 19.5 |

## 25W\_BMI (W\_BMI)

File: data

### Overview

|                  |                         |
|------------------|-------------------------|
| Type: Continuous | Valid cases: 434        |
| Format: numeric  | Invalid: 1              |
| Decimals: 0      | Minimum: 7              |
| Range: 7-57      | Maximum: 57             |
|                  | Mean: 30                |
|                  | Standard deviation: 7.6 |

## Days\_since\_24W\_injection (Days\_since\_24W\_injection)

File: data

### Overview

|                  |                        |
|------------------|------------------------|
| Type: Continuous | Valid cases: 435       |
| Format: numeric  | Invalid: 0             |
| Decimals: 0      | Minimum: 0             |
| Range: 0-225     | Maximum: 225           |
|                  | Mean: 12.4             |
|                  | Standard deviation: 24 |

## Un\_D0\_MPA (Un\_D0\_MPA)

File: data

### Overview

|                     |                         |
|---------------------|-------------------------|
| Type: Continuous    | Valid cases: 234        |
| Format: numeric     | Invalid: 201            |
| Decimals: 2         | Minimum: 0.1            |
| Range: 0.129-14.333 | Maximum: 14.3           |
|                     | Mean: 2.3               |
|                     | Standard deviation: 2.5 |

## Un\_D0\_NET (Un\_D0\_NET)

File: data

### Overview

|                    |                         |
|--------------------|-------------------------|
| Type: Continuous   | Valid cases: 124        |
| Format: numeric    | Invalid: 311            |
| Decimals: 2        | Minimum: 0.2            |
| Range: 0.171-16.92 | Maximum: 16.9           |
|                    | Mean: 1                 |
|                    | Standard deviation: 1.8 |



## Un\_D0\_LNG (Un\_D0\_LNG)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0.339-6.238

Valid cases: 30  
Invalid: 405  
Minimum: 0.3  
Maximum: 6.2  
Mean: 1.7  
Standard deviation: 1.5

## Un\_D0\_ETG (Un\_D0\_ETG)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0.508-1.843

Valid cases: 5  
Invalid: 430  
Minimum: 0.5  
Maximum: 1.8  
Mean: 1  
Standard deviation: 0.6

## Un\_D0\_NES (Un\_D0\_NES)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0.14-2.076

Valid cases: 8  
Invalid: 427  
Minimum: 0.1  
Maximum: 2.1  
Mean: 0.5  
Standard deviation: 0.6

## Un\_D0\_GES (Un\_D0\_GES)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 1.769-2.542

Valid cases: 2  
Invalid: 433  
Minimum: 1.8  
Maximum: 2.5  
Mean: 2.2  
Standard deviation: 0.5

## Un\_25W\_MPA (Un\_25W\_MPA)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0.129-20.348

Valid cases: 271  
Invalid: 164  
Minimum: 0.1  
Maximum: 20.3  
Mean: 5.8  
Standard deviation: 4.1

## Un\_25W\_NET (Un\_25W\_NET)

File: data

### Overview

|                     |                         |
|---------------------|-------------------------|
| Type: Continuous    | Valid cases: 258        |
| Format: numeric     | Invalid: 177            |
| Decimals: 2         | Minimum: 0.2            |
| Range: 0.191-52.936 | Maximum: 52.9           |
|                     | Mean: 12.9              |
|                     | Standard deviation: 8.9 |

## Un\_25W\_LNG (Un\_25W\_LNG)

File: data

### Overview

|                    |                         |
|--------------------|-------------------------|
| Type: Continuous   | Valid cases: 15         |
| Format: numeric    | Invalid: 420            |
| Decimals: 2        | Minimum: 0.4            |
| Range: 0.368-7.076 | Maximum: 7.1            |
|                    | Mean: 1.8               |
|                    | Standard deviation: 2.1 |

## Un\_25W\_ETG (Un\_25W\_ETG)

File: data

### Overview

|                    |                         |
|--------------------|-------------------------|
| Type: Continuous   | Valid cases: 3          |
| Format: numeric    | Invalid: 432            |
| Decimals: 2        | Minimum: 0.5            |
| Range: 0.545-1.023 | Maximum: 1              |
|                    | Mean: 0.8               |
|                    | Standard deviation: 0.2 |

## Un\_25W\_NES (Un\_25W\_NES)

File: data

### Overview

|                    |                         |
|--------------------|-------------------------|
| Type: Continuous   | Valid cases: 13         |
| Format: numeric    | Invalid: 422            |
| Decimals: 2        | Minimum: 0.1            |
| Range: 0.143-1.903 | Maximum: 1.9            |
|                    | Mean: 0.4               |
|                    | Standard deviation: 0.5 |

## Un\_25W\_GES (Un\_25W\_GES)

File: data

### Overview

|                    |                         |
|--------------------|-------------------------|
| Type: Continuous   | Valid cases: 2          |
| Format: numeric    | Invalid: 433            |
| Decimals: 2        | Minimum: 3.8            |
| Range: 3.843-4.964 | Maximum: 5              |
|                    | Mean: 4.4               |
|                    | Standard deviation: 0.8 |

## Im\_D0\_MPA (Im\_D0\_MPA)

### File: data

#### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0-14.333

Valid cases: 434  
Invalid: 1  
Minimum: 0  
Maximum: 14.3  
Mean: 1.2  
Standard deviation: 2.2

## Im\_D0\_NET (Im\_D0\_NET)

### File: data

#### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0-16.92

Valid cases: 434  
Invalid: 1  
Minimum: 0  
Maximum: 16.9  
Mean: 0.3  
Standard deviation: 1.1

## Im\_D0\_LNG (Im\_D0\_LNG)

### File: data

#### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0-6.238

Valid cases: 434  
Invalid: 1  
Minimum: 0  
Maximum: 6.2  
Mean: 0.1  
Standard deviation: 0.6

## Im\_D0\_ETG (Im\_D0\_ETG)

### File: data

#### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0-1.843

Valid cases: 434  
Invalid: 1  
Minimum: 0  
Maximum: 1.8  
Mean: 0  
Standard deviation: 0.1

## Im\_D0\_NES (Im\_D0\_NES)

### File: data

#### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0-2.076

Valid cases: 434  
Invalid: 1  
Minimum: 0  
Maximum: 2.1  
Mean: 0  
Standard deviation: 0.1

## Im\_D0\_GES (Im\_D0\_GES)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0-2.542

Valid cases: 434  
Invalid: 1  
Minimum: 0  
Maximum: 2.5  
Mean: 0  
Standard deviation: 0.1

## Im\_25W\_MPA (Im\_25W\_MPA)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0-20.348

Valid cases: 434  
Invalid: 1  
Minimum: 0  
Maximum: 20.3  
Mean: 3.6  
Standard deviation: 4.3

## Im\_25W\_NET (Im\_25W\_NET)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0-52.936

Valid cases: 434  
Invalid: 1  
Minimum: 0  
Maximum: 52.9  
Mean: 7.7  
Standard deviation: 9.3

## Im\_25W\_LNG (Im\_25W\_LNG)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0-7.076

Valid cases: 434  
Invalid: 1  
Minimum: 0  
Maximum: 7.1  
Mean: 0.1  
Standard deviation: 0.5

## Im\_25W\_ETG (Im\_25W\_ETG)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0-1.023

Valid cases: 434  
Invalid: 1  
Minimum: 0  
Maximum: 1  
Mean: 0  
Standard deviation: 0.1

## Im\_25W\_NES (Im\_25W\_NES)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0-1.903

Valid cases: 434  
Invalid: 1  
Minimum: 0  
Maximum: 1.9  
Mean: 0  
Standard deviation: 0.1

## Im\_25W\_GES (Im\_25W\_GES)

File: data

### Overview

Type: Continuous  
Format: numeric  
Decimals: 2  
Range: 0-4.964

Valid cases: 434  
Invalid: 1  
Minimum: 0  
Maximum: 5  
Mean: 0  
Standard deviation: 0.3

