

South Africa - AHRI.Population Intervention Programme:Images of point of care HIV tests 2017-2022

Sweetness H Dube

Report generated on: February 9, 2023

Visit our data catalog at: <https://data.ahri.org/index.php>

Overview

Identification

ID NUMBER

AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1

Version

VERSION DESCRIPTION

v1.0.0

Overview

ABSTRACT

As part of the ongoing individual health surveillance, Africa Health Research Institute (AHRI) collect point of care HIV test images from all consenting resident individuals aged 15 years and above. Operationally, these images are used by clinical research operations team as part of the quality assurance process to check if the HIV test results captured in the electronic data collection system are accurately entered and that patient referral is done appropriately for those needing HIV care. Scientifically, these images were also used in machine learning study conducted in collaboration with University College London which aimed at developing and piloting new mobile phone connected diagnostic tests for use in community settings. These tests used an application linked to a mobile camera to interpret the results. The performance of the tests was benchmarked to gold-standard diagnostic tests (Enzyme Linked ImmunoSorbent Assays (ELISA) and Polymerase Chain Reaction (PCR)) using patient samples (n=100).

For more, refer: Turbé, V., Herbst, C., Mngomezulu, T. et al. Deep learning of HIV field-based rapid tests. Nat Med 27, 1165-1170 (2021). <<https://doi.org/10.1038/s41591-021-01384-9>>

KIND OF DATA

Machine readable images of point of care (POC) HIV tests.

UNITS OF ANALYSIS

Photographs of individual test strip responses.

TOPICS

| Topic | Vocabulary | URI |
|---|----------------------------------|--|
| HIV-1, Incidence, Machine Learning, Population Surveillance, Rural Population, HIV Infections, Africa | Africa Health Research Institute | www.ahri.org |

KEYWORDS

HIV rapid test, Point-of-care test, Lateral Flow test, images

Coverage

GEOGRAPHIC COVERAGE

South Africa.

AHRI's Population Intervention Programme Study Area (PIPSA) situated in uMkhanyakude district KwaZulu-Natal province which is approximately 200km north of Durban. The area is approximately 845km² in size and since 2017, the area has been expanded in to include the area which was formerly used for a cluster randomised trial on treatment as a prevention(TasP).

For more refer:

1. Dickman Gareta, Kathy Baisley, Thobeka Mngomezulu, Theresa Smit, Thandeka Khoza, Siyabonga Nxumalo, Jaco Dreyer, Sweetness Dube, Nomathamsanqa Majozi, Gregory Ording-Jespersion, Eugene Ehlers, Guy Harling, Maryam Shahmanesh, Mark Siedner, Willem Hanekom, Kobus Herbst, Cohort Profile Update: Africa Centre Demographic Information System (ACDIS) and population-based HIV survey, International Journal of Epidemiology, Volume 50, Issue 1, February 2021, Pages 33-34, <<https://doi.org/10.1093/ije/dyaa264>>

2. Tanser F, Hosegood V, Bärnighausen T, Herbst K, Nyirenda M, Muhwava W, Newell C, Viljoen J, Mutevedzi T, Newell ML. Cohort Profile: Africa Centre Demographic Information System (ACDIS) and population-based HIV survey. Int J Epidemiol. 2008 Oct;37(5):956-62. doi: 10.1093/ije/dym211. Epub 2007 Nov 12. PMID: 17998242; PMCID: PMC2557060.

3. Iwuji CC, Orne-Gliemann J, Larmarange J, Balestre E, Thiebaut R, Tanser F, Okesola N, Makowa T, Dreyer J, Herbst K, McGrath N, Bärnighausen T, Boyer S, De Oliveira T, Rekacewicz C, Bazin B, Newell ML, Pillay D, Dabis F; ANRS 12249 TasP Study Group. Universal test and treat and the HIV epidemic in rural South Africa: a phase 4, open-label, community cluster randomised trial. Lancet HIV. 2018 Mar;5(3):e116-e125. doi: 10.1016/S2352-3018(17)30205-9. Epub 2017 Nov 30. PMID: 29199100.

UNIVERSE

All resident household members from AHRI's PIPSA aged 15 years and above and who gave informed consent for their rapid HIV test images to be photographed

Producers and Sponsors

PRIMARY INVESTIGATOR(S)

| Name | Affiliation |
|----------------|-------------|
| Kobus Herbst | AHRI |
| Guy Harling | AHRI |
| Mark Siedner | AHRI |
| Willem Hanekom | AHRI |

OTHER PRODUCER(S)

| Name | Affiliation | Role |
|----------------------------------|-------------|------|
| Africa Health Research Institute | | |

FUNDING

| Name | Abbreviation | Role |
|----------------|--------------|--------|
| Wellcome Trust | WT | Funder |
| SAPRIN | SAPRIN | Funder |

OTHER ACKNOWLEDGEMENTS

| Name | Affiliation | Role |
|--------------------|-------------|----------------------|
| Thobeka Mngomezulu | AHRI | Data collection |
| Phumzile Dlamini | AHRI | Data collection |
| Lindiwe Sithole | AHRI | Data collection |
| Bonginkosi Ntimane | AHRI | Data quality |
| Njabulo Myeni | AHRI | Data quality |
| Eugene Ehlers | AHRI | Software Development |
| Eugene Prenzler | AHRI | Data Analytics |
| Brendan Gilbert | AHRI | IT infrastructure |

| | | |
|-------------------|------|--------------------------|
| Sweetness Dube | AHRI | Data documentation |
| Siyabonga Nxumalo | AHRI | Research Data management |
| Dickman Gareta | AHRI | Research Data management |

Metadata Production

METADATA PRODUCED BY

| Name | Abbreviation | Affiliation | Role |
|----------------------------------|--------------|-------------|------|
| Africa Health Research Institute | AHRI | | |

DDI DOCUMENT ID

DDI.AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1

Sampling

Sampling Procedure

Rapid HIV test image collection is integrated within the routine AHRI individual health surveillance

Questionnaires

No content available

Data Collection

Data Collection Dates

| Start | End | Cycle |
|--------------|------------|--------------|
| 2017-01-01 | 2022-12-05 | N/A |

Data Processing

Data Editing

The raw images have been stripped of the GPS coordinates and index data is completely anonymised.

Data Appraisal

No content available

File Description

Variable List

AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1

Content

Cases 28181

Variable(s) 7

Structure
Type:
Keys: ()

Version

Producer

Missing Data

Variables

| ID | NAME | LABEL | TYPE | FORMAT | QUESTION |
|-----|-------------------------|------------------------------|----------|-----------|----------|
| V39 | IntId | IntId | contin | numeric | |
| V40 | SpecimenCollectionDate | SpecimenCollectionDate | discrete | character | |
| V41 | ConsentToPhoto | ConsentToPhoto | discrete | character | |
| V42 | HIVRapidtestResultFinal | HIV Rapidtest Result - Final | discrete | character | |
| V43 | FileName | FileName | discrete | character | |
| V44 | DBSSampleID | DBSSampleID | contin | numeric | |
| V45 | HIVDBSResult | HIVDBSResult | discrete | character | |

IIntId (IIntId)

File: AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1

Overview

| | |
|------------------|---------------------------|
| Type: Continuous | Valid cases: 28181 |
| Format: numeric | Invalid: 0 |
| Decimals: 0 | Minimum: 34 |
| Range: 34-262168 | Maximum: 262168 |
| | Mean: 109324 |
| | Standard deviation: 67685 |

SpecimenCollectionDate (SpecimenCollectionDate)

File: AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1

Overview

| | |
|-------------------|--------------------|
| Type: Discrete | Valid cases: 28181 |
| Format: character | Invalid: 0 |
| Width: 10 | |

ConsentToPhoto (ConsentToPhoto)

File: AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1

Overview

| | |
|-------------------|--------------------|
| Type: Discrete | Valid cases: 28165 |
| Format: character | Invalid: 0 |
| Width: 3 | |

HIV Rapidtest Result - Final (HIVRapidtestResultFinal)

File: AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1

Overview

| | |
|-------------------|--------------------|
| Type: Discrete | Valid cases: 28093 |
| Format: character | Invalid: 0 |
| Width: 10 | |

FileName (FileName)

File: AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1

Overview

| | |
|-------------------|--------------------|
| Type: Discrete | Valid cases: 28181 |
| Format: character | Invalid: 0 |
| Width: 32 | |

DBSSampleID (DBSSampleID)

File: AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1

Overview

Type: Continuous
 Format: numeric
 Decimals: 0
 Range: 1090002-1168551

Valid cases: 28181
 Invalid: 0
 Minimum: 1090002
 Maximum: 1168551
 Mean: 1129273.2
 Standard deviation: 19105.9

HIVDBSResult (HIVDBSResult)

File: AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1

Overview

Type: Discrete
 Format: character
 Width: 1

Valid cases: 28181
 Invalid: 0

Documentation

Technical documents

DDI:PIP.RapidHIVTestImagesMetaData.2022.V1

| | |
|--------------|---|
| Title | DDI:PIP.RapidHIVTestImagesMetaData.2022.V1 |
| Author(s) | Sweetness H Dube |
| Date | 08/02/2023 |
| Country | South Africa |
| Language | English |
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