

**South Africa**

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

**Study Documentation**

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# Metadata Production

<b>Metadata Producer(s)</b>	Africa Health Research Institute (AHRI)
<b>Identification</b>	DDI.AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1

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

Overview	
<b>Identification</b>	AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1
<b>Version</b>	v1.0.0
<b>Abstract</b>	
<p>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).</p> <p>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). &lt;<a href="https://doi.org/10.1038/s41591-021-01384-9">https://doi.org/10.1038/s41591-021-01384-9</a>&gt;</p>	
<b>Kind of Data</b>	Machine readable images of point of care (POC) HIV tests.
<b>Unit of Analysis</b>	Photographs of individual test strip responses.

Scope & Coverage	
<b>Keywords</b>	HIV rapid test, Point-of-care test, Lateral Flow test, images
<b>Topics</b>	HIV-1, Incidence, Machine Learning, Population Surveillance, Rural Population, HIV Infections, Africa
<b>Time Period(s)</b>	2017-2022
<b>Countries</b>	South Africa
<b>Geographic Coverage</b>	
<p>South Africa.</p> <p>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 845km<sup>2</sup> 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).</p> <p>For more refer:</p> <ol style="list-style-type: none"> <li>Dickman Gareta, Kathy Baisley, Thobeka Mngomezulu, Theresa Smit, Thandeka Khoza, Siyabonga Nxumalo, Jaco Dreyer, Sweetness Dube, Nomathamsanqa Majazi, Gregory Ordng-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, &lt;<a href="https://doi.org/10.1093/ije/dyaa264">https://doi.org/10.1093/ije/dyaa264</a>&gt;</li> <li>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.</li> </ol>	

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 & Sponsors**

<b>Primary Investigator(s)</b>	Kobus Herbst, AHRI Guy Harling, AHRI Mark Siedner, AHRI Willem Hanekom, AHRI
<b>Other Producer(s)</b>	Africa Health Research Institute (AHRI)
<b>Funding Agency/ies</b>	Welcome Trust (WT) , Funder SAPRIN (SAPRIN) , Funder
<b>Other Acknowledgment(s)</b>	Thobeka Mngomezulu , Data collection , AHRI Phumzile Dlamini , Data collection , AHRI Lindiwe Sithole , Data collection , AHRI Bonginkosi Ntimane , Data quality , AHRI Njabulo Myeni , Data quality , AHRI Eugene Ehlers , Software Development , AHRI Eugene Prenzler , Data Analytics , AHRI Brendan Gilbert , IT infrastructure , AHRI Sweetness Dube , Data documentation , AHRI Siyabonga Nxumalo , Research Data management , AHRI Dickman Gareta , Research Data management , AHRI

## **Sampling**

### **Sampling Procedure**

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

## **Data Collection**

<b>Data Collection Dates</b>	start 2017-01-01 end 2022-12-05
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## **Data Processing & Appraisal**

### **Data Editing**

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

## **Accessibility**

### **Access Conditions**

Access to the data requires accurate completion of the online data access application form accessible on the AHRI Data repository(<<https://data.ahri.org/>>). Data users are required to abide by the data use conditions stipulated on the application for access to the data. Failure to do so may result in their data access privileges revoked by the Data Custodian. In order to

recognise the effort and intellectual contributions of AHRI investigators in producing and curating the data, users of AHRI data must acknowledge the source of the data and abide by the terms and conditions under which the data is accessed. All analytical datasets published on the AHRI Data Repository are assigned digital object identifier (DOIs) and the DOIs can be found on the Data Repository under Study Description tab - Access policy. AHRI data users are required to always cite the dataset using the DOI.

Due to the size of the zip file(>50GB), the images could not be published on the AHRI Data Repository. The images are therefore stored on the AHRI SharePoint. Users must request for access on the AHRI Data Repository by completing the online data request application form. Access to the SharePoint will only be granted to the data user once the Data Custodian has approved the user data request.

**Citation Requirements**

Herbst, K., Harling, G., Siedner, M., & Hanekom, W. (2023). Population Intervention Programme:Images of point of care HIV tests 2017-2022 [Data set]. Africa Health Research Institute. <https://doi.org/10.23664/AHRI.PIP.RAPIDHIVTESTIMAGESMETADATA.2022>

# Files Description

Dataset contains 1 file(s)

<b>AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1</b>	
<b># Cases</b>	28181
<b># Variable(s)</b>	7

# Variables List

Dataset contains 7 variable(s)

File AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1							
#	Name	Label	Type	Format	Valid	Invalid	Question
1	<a href="#">IintId</a>	IintId	continuous	numeric.0	28181	0	-
2	<a href="#">Specimen ..</a>	SpecimenCollectionDate	discrete	character-10	28181	0	-
3	<a href="#">ConsentT ..</a>	ConsentToPhoto	discrete	character-3	28165	0	-
4	<a href="#">HIVRapid ..</a>	HIV Rapidtest Result - Final	discrete	character-10	28093	0	-
5	<a href="#">FileName</a>	FileName	discrete	character-32	28181	0	-
6	<a href="#">DBSSampl ..</a>	DBSSampleID	continuous	numeric.0	28181	0	-
7	<a href="#">HIVDBSRe ..</a>	HIVDBSResult	discrete	character-1	28181	0	-

# Variables Description

Dataset contains 7 variable(s)

# File : AHRI.PIP.RapidHIVTestImagesMetaData.2022.V1

## # IintId: IintId

**Information** [Type= continuous] [Format=numeric] [Range= 34-262168] [Missing=\*]

**Statistics [NW/ W]** [Valid=28181 /-] [Invalid=0 /-] [Mean=109324 /-] [StdDev=67685.025 /-]

## # SpecimenCollectionDate: SpecimenCollectionDate

**Information** [Type= discrete] [Format=character] [Missing=\*]

**Statistics [NW/ W]** [Valid=28181 /-] [Invalid=0 /-]

## # ConsentToPhoto: ConsentToPhoto

**Information** [Type= discrete] [Format=character] [Missing=\*]

**Statistics [NW/ W]** [Valid=28165 /-] [Invalid=0 /-]

## # HIVRapidtestResultFinal: HIV Rapidtest Result - Final

**Information** [Type= discrete] [Format=character] [Missing=\*]

**Statistics [NW/ W]** [Valid=28093 /-] [Invalid=0 /-]

## # FileName: FileName

**Information** [Type= discrete] [Format=character] [Missing=\*]

**Statistics [NW/ W]** [Valid=28181 /-] [Invalid=0 /-]

## # DBSSampleID: DBSSampleID

**Information** [Type= continuous] [Format=numeric] [Range= 1090002-1168551] [Missing=\*]

**Statistics [NW/ W]** [Valid=28181 /-] [Invalid=0 /-] [Mean=1129273.196 /-] [StdDev=19105.894 /-]

## # HIVDBSResult: HIVDBSResult

**Information** [Type= discrete] [Format=character] [Missing=\*]

**Statistics [NW/ W]** [Valid=28181 /-] [Invalid=0 /-]