**MTN Secondary Data Analysis Request Form**

**Instructions:**

To request approval for MTN to perform an secondary data analysis, complete this form, then print it, hand sign and hand date it, and send a scanned copy of your signed and dated application to the FHI 360 Clinical Research Manager for the MTN Protocol that this relates to. See the MTN MOP Section titled, *Ancillary Study Proposal, Secondary Data Analysis Requests and Request for Data Sets*, for more detailed information.

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| **1. Application date** |  |
| **2. Number and title of primary MTN study to which the analyses will be linked** | MTN003 VOICe study |
| **3. Name and contact information for proposing MTN investigator (include institutional affiliation/email/phone)** | Thesla Palanee-Phillips  Position: Site Leader, Director of Clinical Trials  Organization: Wits Reproductive Health and HIV Institute (Wits RHI), Research Center  Email: tpalanee@wrhi.ac.za  Primary Phone: +27 11 358 5471  Secondary Phone: +27 837833574  Fax: +27 0865541093 |
| **4. Name and contact information for non-MTN collaborating investigator (institutional affiliation/email/phone)** | Matthew Chersich  Position: Primary Investigator, Research Professor  Organization: Climate and Health Directorate, Wits Reproductive Health and HIV Institute (Wits RHI)  Email: mchersich@wrhi.ac.za  Primary Phone: +27113585300  Secondary Phone: +27 72 752 1123 |
| **5. Description of proposed study, including rationale, purpose, objectives, methods, necessary staff and other resources, and other relevant information** | Description of Proposed Study  Title: Advancing Understanding of Heat-Health Interactions in Large African Cities  **Rationale:** The proposed study is a part of the HE²AT Center's research projects, aiming to address the complex issue of heat-health impacts in urban spaces, particularly focusing on vulnerable groups. The study is funded by the Fogarty International Center and National Institute of Environmental Health Sciences (NIEHS) and OD/Office of Strategic Coordination (OSC) of the National Institutes of Health under Award Number U54 TW 012083.  **Purpose:** The primary goal of this research project is to enhance the understanding of spatially and demographically stratified heat-health interactions in large African cities. The insights gained from this study will be used to develop locally relevant and risk-stratified Early Warning Systems.  **Objectives: The study has three main objectives:**  To map intra-urban heat vulnerability and exposure across urban areas in large African cities.  To develop a spatially and demographically stratified heat-health outcome forecast model.  To create an Early Warning System that reflects geospatial and individualized risk patterns.  Methods: The study will employ a range of machine learning methods to quantify intra-urban socio-economic and environmental vulnerability in Abidjan, Côte d'Ivoire and Johannesburg, South Africa. High-resolution urban temperature hazard maps will be developed using these machine learning models. The study will then develop a heat-health outcome model that integrates operational weather forecasts with high-resolution weather hazard data and vulnerability models. Finally, an Early Warning System, including a digital App, will be developed.  Necessary Staff and Other Resources: The project will be led by Prof Cisse (UPGC) and supported by Dr Jack (UCT), who will construct the climate science models. The team will include several IBM Research Africa machine learning experts (Drs Makhanya, Weldemariam, and Vos), and Profs Waljee and Zhu (University of Michigan). Prof. Ebi from the University of Washington will guide the Early Warning System formulation.  Other Relevant Information: The project aligns closely with the DS-I Africa objectives, particularly its solution focus, possibilities for expansion to other Research Hubs, and the potential for progressive expansion to cities across Africa. The Vulnerability-Heat-Health approach used in the project has particular relevance for industries with outdoor workers, who need sensitive and specific warnings on extreme heat to avoid health and economic losses. |
| **6. How will data from the proposed study be managed and analyzed?** | Specify who will be responsible (e.g. MTN SDMC) and where data will be managed and analysed; attach additional sheets as needed.  **Data Management and Analysis**  The data management and analysis for the proposed study will be conducted in several stages and will be the responsibility of the HEAT Center DMAC team. The team includes various roles and responsibilities associated with the data management plan. The key roles and their responsibilities are as follows:  DMAC PIs: Responsible for ongoing (quarterly) assessment of data management and changes to the data management plan (annual). The DMAC PIs are Christopher Jack (UCT) and Sibusisiwe Makhanya (IBM).  Health Data Acquisition: Identification of relevant health datasets, coordination, and development of the DSA. This role is fulfilled by Matthew Chersich and Craig Parker for RP2 from WITS RHI.  Data Processing and Harmonization: De-identification, quality control, remapping, harmonization, and integration of all datasets. This role is fulfilled by Lisa van Aardenne, Pierre Kloppers, Piotr Wolski, Nelson Bore, and Toby Kurien.  Managing Access to UCT Data Analysis Platform: This role is fulfilled by Rodger Duffett from UCT.  Managing Access to IBM PAIRS Platform: This role is fulfilled by Toby Kurien from IBM.  The data management and analysis will comply with the specific requirements of the Protection of Personal Information Act (POPIA 2013) to ensure data privacy and security.  The data management and analysis process will include the following stages:  Data Collection: The study will begin by quantifying intra-urban socio-economic and environmental vulnerability in Abidjan, Côte d'Ivoire and Johannesburg, South Africa. This involves deploying a range of machine learning methods to construct an index of intra-urban socio-economic and environmental vulnerability factors.  Data Analysis: High resolution urban temperature hazard maps will be developed using machine learning models. The study will then develop a spatially and demographically explicit heat-health outcome model. The model will integrate operational weather forecasts with the high-resolution weather hazard data and vulnerability models generated in the previous step.  Data Utilization: In the final set of activities, an Early Warning System, including a digital App, will be developed. This system will be driven by the heat-health outcome forecast model developed in the previous step. The system will also allow for gathering of information on App usability and feedback information, allowing for data collection, and testing and re-calibration of the underlying heat-health model.  Data Sharing: Governments will also be supported to modify their Early Warning System to include specific temperature thresholds for different population groups, based on their risks. The Vulnerability-Heat-Health approach used in the Project has particular relevance for industries with outdoor workers.  Data Protection: The study will ensure that all data collected and used will adhere to the highest standards of data protection and privacy. All data will be anonymized and stored securely, with access restricted to authorized personnel only.  The data will be managed and analyzed at the respective institutions of the team members, including UCT, IBM, and WITS RHI. The data management plan will be periodically assessed by the DMAC co-PIs in consultation with the HEAT Steering Committee including RP1 and RP2 leads. This will take place at least every 6 months. Based on the assessment, the Data Management Plan will be updated and changes will be implemented. Revisions to the Data Management Plan will be proposed by the DMAC Co-PIs and approved by the SC. |
| **7. Are supplemental MTN funds required for the proposed study?** | If Yes, specify amount and purpose of funds requested, attach additional sheets as needed.  If No, specify source of funding.  No, The funding for the proposed study is provided by the Fogarty International Center and National Institute of Environmental Health Sciences (NIEHS) and OD/Office of Strategic Coordination (OSC) of the National Institutes of Health under Award Number U54 TW 012083 |

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Signature of the Investigator Requesting the Analysis Date

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Printed or typed name of Investigator Requesting the Analysis