Outline

- Diagnostics & Health Supply Chain System
- Regulatory Framework
- Emergency Preparedness & Response
- Community Outreach
Malawi

• 8.8% adults and 1.8% of children (0-14 years) living with HIV
• 30% of children living with HIV NOT on treatment will die before their 1\textsuperscript{st} birthday
• Only 53% of children with HIV are on treatment
• 4100 child deaths due to HIV in 2017
Early Infant Diagnosis of HIV
Phase 2: Nkhatabay and Likoma Districts

Piloting an optimized diagnostics supply chain, integrating motorbikes, drones and point of care diagnostics for early infant diagnosis of HIV, viral load and TB to improve access to care and treatment
Turnaround time for EID/VL/TB specimen collection and delivery of test results (illustrative example for Nkhata Bay)

- Specimen collection*
  - 1 day* or more
  - Same day
  - 1-6 days or more
  - Same day

- Collection from HC
  - Deliver to DHO
  - Same day

- Pick up from DHO
  - Deliver to Mzuzu Lab
  - Same day

- Deliver to DHO
  - Results pick up from Mzuzu Lab
  - 14 days or more

- Deliver to Mzuzu Lab
  - 1-6 days or more

- Deliver to HC*
  - Same day

- Collection from DHO
Government endorsement

- Ministry of Transport
- Ministry of Home Affairs
- Ministry of Local Government and the Police
- Ministry of Foreign Affairs
- Ministry of Information
- Ministry of Defense
INTERNATIONAL SERIES ‘A’

AERONAUTICAL INFORMATION CIRCULAR

TECHNICAL GUIDANCE ON OPERATIONS OF REMOTELY PILOTED AIRCRAFT (RPA) IN MALAWI AIRSPACE

1.0 PURPOSE

This Aeronautical Information circular (AIC) is issued to provide guidance on operations of Remotely Piloted Aircraft (RPA) for various applications in Malawi.

2.0 POLICY

It is the policy of the Department of Civil Aviation (DCA) that RPAs operating in Malawi must meet or exceed the safety and operational standards as those for manned aircraft. Thus, RPA operations must be as safe as manned aircraft so that they must not present or create a
Emergency response: 2015
Disaster response – 2017 floods
DRONE & DATA INNOVATIONS FOR CHILDREN IN MALAWI

GEO-SPATIAL ANALYSIS, DRONES & MACHINE LEARNING AS TOOLS FOR DEVELOPMENT & HUMANITARIAN RESPONSE
Kasungu corridor

- 40 km radius, 400 meters AGL
- 1 central hospital laboratory;
- >300 schools, health centers, clinics
- National Park partially covered
- Population: 480,700 people
- ≈15 villages within reach per flight
Applicants agree …

- to follow the drone regulations set forth by the Civil Aviation Authority
- to acquire a third-party insurance
- to assume all costs in relation to the operation and other related activities
- to grant open access to - and share - data learnings and results acquired
- to provide skills training and conduct workshops among local youth
Image creation – 2D Orthomosaics
Tests in the Malawi drone testing corridor
- Focuses on imagery & mapping;
- Feeds drones captured images to IBM Watson to create data through AI and image
ORTHOMOSAIC KASUNGU

The Kasungu site is a densely populated urban area, covering several neighborhoods, parts of major road network and infrastructure (e.g. schools, health delivery points, house of worship).

Area: 7.15 km²
Images: 6082
Size of data: 5.3MB per image
Number of flights: 27 in order to generate the desired 2D and 3D maps

Processing time: The actual processing time has been between 5 - 10 min per image due to limited internet connectivity at that time which was heavily attributed by the power situation.
IMAGE ANALYSIS – How Does It Work?

Artificial Intelligence (aka algorithms) gets trained to recognize certain features in pictures through the use of “classifiers” and applies this logic to new pictures.
This process helps to generate (statistical) data out of pictures and helps you to draw conclusions and make according recommendations.

For example: **SDG Indicator 6.2.1** - Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water.

The map shows latrines with a 50m radius circle and provides an insight into the access to sanitation in this area.

At this test, the confidence level is at 70% as some detections might be missing (or falsely detected) - but with more training time the accuracy will improve.
DATA FOR CHOLERA RESPONSE

GEO-SPATIAL + DRONES + MACHINE LEARNING APPLICATIONS

1. Community sensitization

2. Drone data acquisition

2a. Drone acquired imagery used for community engagement

3. Ground truth data acquisition by LUANAR students (sample of data on cholera related features)

4. Artificial Intelligence used to identify cholera related features

5. Data analysis and identification of potential cholera hotspots

6. Results dissemination
The corridor leads the way to:

- The automated provision of drone services (imagery, transport, connectivity)
- Through establishing an eco-system establishing local expertise
- Within an airspace safely managed by a drone traffic management system (UTM)
- And the help of local & international partners
Questions & Feedback

Thank you from UNICEF Malawi

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