Can UAVs Fill the Delivery Gap for Global Development?

Final Mile Logistics Working Group
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Our Approach: *Starting at the Last Mile*

Often, the last mile of healthcare is in the most remote and difficult to reach communities.

Our approach starts here.

Successful, sustainable and scalable solutions are intentionally designed and built to work within last mile constraints.
Today: Trucks, Bikes, Boats and Motorcycles
Delivery may be Difficult or Impossible...
Drone Technology

- **Fixed-wing**
- **Rotary-wing**
- **Hybrid**
Payload vs. Distance range

Modified from Wings for Aid slide
UNICEF Malawi Study (Partners: VillageReach & Matternet)

A. Can UAVs transport blood samples to labs for HIV rapid testing?
B. What is the cost of UAVs in the wider transport network?
C. How do UAVs work as part of a laboratory transport system?
93 flights in Malawi to test concept, build buy-in, understand and address stakeholder concerns and collect costing data

VillageReach costed 4 scenarios comparing UAV to motorcycle transport system

- Total monthly transportation costs higher for the UAS than for the motorcycle system except in hub & spoke, carrying only EID samples
- Motorcycle system: higher vehicle costs, lower useful life, fuel costs represented about 20% of total costs (only 0.05% of the total costs of the UAS)
- UAS: batteries, chargers, and landing devices were important cost drivers in the UAS
- Analysis did not attempt to quantify health impacts or impact of transportation speed on other logistics costs
A fleet of 20 Zipline UAVs will allow health workers to place an order for blood by SMS, which is launched within minutes.
2- Blood Delivery in Rwanda (2/2)
3. Simulation used to Assess UAVs Benefits

Results published in July 25th issue of journal Vaccine
Challenges UAVs Face

- **Technology**
  - Distance vs. Power
  - Distance vs. Weight
  - Transmission signal
  - Battery charge & materials
  - Collision avoidance automation

- **Cargo**
  - Fragile
  - Sensitive to temp
  - Expensive
  - Limited space
  - Limited weight
  - Biological/biohazard

- **Environment**
  - Bad weather
  - Terrain/topography
  - Animals & Birds
  - Human interference

- **Economic**
  - Cost of drone
  - Infrastructure
  - Pilot training
  - Maintenance
  - Additional system devices

- **Political**
  - Regulations
  - Military connotations
  - Security – national, personal data
  - Public acceptance
  - Growing local technical capacity

- **Social/Community**
  - Evolving perceptions (military → healthcare)
  - Accidents – people & property
  - Security – national, local
  - Building UAV understanding
Flying Labs Initiative

Cuyo
Jakarta
Santiago
Kathmandu
Dar-es-Salam
Windhoek
Lilongwe
Quito
Lima
Male

We identify, build, impact, and incubate in Flying Labs.

Air
Earth
Water
Robotics
UAV for Payload Delivery Working Group

- **Who?** Groups invested in the development, advancement, and application of UAV in public health and supply chain systems.
- **Goals:** Provides an informal, centralized mechanism to share information, coordinate efforts, and connect with partners & technologies.

**Organizations**
- UNICEF
- PATH
- World Food Programme
- WeRobotics
- fhi360
- VillageReach

**Manufacturer**
- Zipline
- Vayu
- Matternet
- Wings for Aid

**Funders**
- USAID
- Bill & Melinda Gates Foundation
- Gavi

**and more**
- LLamasoft
- Johns Hopkins Bloomberg School of Public Health
- BD

http://uaviators.org/teams/payload-team

Next Webinar: Tuesday, July 26, 8:00PDT – Modeling UAVs for vaccine delivery in Mozambique
Thank You