"What is the 'unique object' flying in the sky?": Understanding community perceptions of drones for healthcare in Nepal

A report

"I used to think that drone is operated by human just like an aeroplane, but after seeing it without human, I was totally surprised." The introduction of drones for healthcare in one of the rural and hilly regions of Nepal- Pyuthan, has generated excitement among the local people. Birat Nepal Medical Trust (BNMT) and DroNepal, two national NGOs, jointly developed an innovative drone clinical sample transport programme for the first time in Nepal in 2019, focusing initially on transporting sputum samples to advanced diagnostic facilities for tuberculosis (TB) diagnosis.

Every year in Nepal, more than 60,000 people develop tuberculosis (TB) disease. With early diagnosis and initiation of treatment, TB can be cured. Yet, every year, between six and seven thousand Nepali people die of this curable, preventable disease. People struggle to reach health services and get a diagnosis. One of the reasons for these problems is distant health facilities and an extremely poor network of roads. Often, people have to walk for hours while sick even to reach a basic health post- often little more than a hut with few medicines. Therefore, to create a linkage between the rural population and the health system, BNMT developed a network of drones to link eight rural health centers with a hospital and a primary health care center where we installed rapid molecular diagnostic testing for TB (the GeneXpert machine).

Farrar foundation has featured this study in its 2020 Newsletter.

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With the introduction of this new technology, it was important to understand community perceptions about the drones, and if the service effectively increased access to healthcare services in the district. In March 2020, with financial support from the Farrar Foundation, Kritika Dixit organized a discussion meeting with local community members of Dharmawati municipality, one of the rural drone locations. During the discussion, the community people shared that the use of drones in geographically remote areas such as Dharmawati Rural Municipality reduced the transportation costs as well as minimized the physical burden to reach health centers which otherwise would take several hours by walking. We noted that the participants were aware of using drones in healthcare for transporting samples. One of the people said, *"Drone is a new technology and effective machine. It goes to the lab and brings the report".* The participants especially strongly requested the use of more drones in healthcare because these technologies are of utmost importance to the elderly, people with a physical disability, and with low socioeconomic conditions. Expressing their emotions, the participants shared that their friends in the

neighborhood were excited to see a 'unique object' flying over their sky, making them curious about it. They shared that following the introduction of drones in the area, there have been awareness-raising programmes for local people, community leaders, and school children both on using drones in the community as well as on the importance of testing for TB. These programmes are crucial to informing the community people about the use of new technologies in healthcare as well as for the safety, security, and shared understanding. During the discussion, people raised their concerns regarding the financial investment on the drones, which they believe is high, and wondered if the money spent is worth the outcome. People recommended using drones in clusters where people are at higher risk of TB and mentioned the need for awareness and advocacy for its optimal benefit. People suggested conducting advocacy campaigns by mobilizing community leaders, mothers' groups, and community health volunteers. These concerns and interest from the local people in using the drone is one of the positive notes for future-scale up and sustainability of the project.

BNMT also conducted another discussion meeting with the neighborhood community, Okharkoat Rural Municipality, where drones have not yet been implemented. The discussion was conducted with local people to understand if they knew about drones and what their perception was regarding the use of drones in their community. During the discussion, a few participants mentioned that they had seen drones taking pictures or mapping the area. The participants discussed that the problems of health, including tuberculosis, is rampant in their community, where people are less aware of the communicable diseases and visit health centers only when their health condition deteriorates or when they are no longer able to leave their bed. The participants also mentioned that the geographical terrain in their community is very rural and people often walk for several hours on foot to reach health centers, which are often away from the settlement area. One of the participants mentioned that "*If drone is used in Okharkoat, it will be a new facility for the people here and it will be highly appreciated."* Other participants claimed that the use of drones is a sign of development. "*I feel that new technologies are used in Pyuthan, it is a sign of development".* Regarding any perceived risks of using drones, one participant mentioned that "*People aren't scared of drones as they are used to seeing aeroplanes and helicopters flying in the sky"*.

Therefore, the community people strongly emphasized the importance and need of using drones in healthcare in the rural areas of Nepal. There is a need to expand the use of drones in rural areas of Nepal in close coordination with local people and improve people's accessibility to the health services.

The results from the qualitative evaluation will be formally analyzed for publication and used to help BNMT and partners design improved engagement activities with community stakeholders during implementation and scaling of this valuable technology.

Farrar Foundation grant recipient Ms Kritika Dixit is an early career global health researcher from Birat Nepal Medical Trust. Kritika is passionate about the need to conduct research to understand the barriers to healthcare access faced by rural and underprivileged people in Nepal, and to provide evidence to inform patient-centric healthcare models which improve equity for Nepal's diverse communities. Kritika reflects, "The grant has been an important

stepping stone towards independent research funding in my academic and professional development. The experience gained during the grant has enabled me to enhance my qualitative research knowledge and skills, introduced me to innovative technology in healthcare, increased my collaboration with local and national authorities and international researchers and more importantly, it has supported me to start my doctoral degree at Karolinska Institutet in Sweden. Following this research, I have received another research grant from Royal Society of Tropical Medicine and Hygiene to study the impact caused by COVID-19 on tuberculosis service delivery. I look forward to expand my research career in global health and I wholeheartedly thank Farrar Foundation for giving me this wonderful opportunity at my initial career stage".

Kritika Dixit, the receipient of Farrar Foundation grant moderating the discussion session with the local community people in Okharkot Health Post, Pyuthan

Drone Pilot inserting the sputum sample box before the flight takes off in front of the local people and school children

Group picture after the discussion