

DRONE APPLICATION IN TELEMEDICINE IN INDIA

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ABSTRACT

Though Telemedicine has been operated since last 2 decades in India in some form or other reaching out to remotest areas of the country providing health care delivery services, drone has given immense potential and new way of enhancing it's capabilities and form a new normal for health care delivery. The Covid-19 Pandemic has facilitated drone use in health care delivery possibilities and both Government and Private Medical and Health Organisations, Start Ups, Logistic Firms, Hospitals, Medical Research Organisations have taken off for wider use, reach and accessibilities, The liberalised Government of India Drone Policy 2021 has immensely encouraged agencies to build strong edifice of Telemedicine Heal Care Delivery Services to the remotest corners of the country, which has topographical and accessibility problems, thus bridge the gaps of healthcare. The Paper tries to discuss the drone applications in Telemedicine in India, in the new normal environment.

KEY WORDS: *Telemedicine, UAVs, Digital Sky, i-DRONE, Green Zone*

INTRODUCTION

The Covid-19 pandemic has accelerated the use of drone technology and its adoption as emerging technologies in India. The Covid-19 lockdown, brought in enumerable difficulties in getting access to basic essential facilities and thus people tried to seek new solutions to routine tasks, be it food delivery, medical consultations, or education. Further for Government, ensuring public health, to capture all information of Covid-19 cases, movement of patients, ensuring logistics of medicines and other supporting supplies, governance, identification, management, and the like, necessitated adoption of technology platforms and solutions.

Government adopted newer methods of disruptive innovations and technologies for surveillance which has become the new normal and mainstreamed in health care delivery in India

As per the WHO, the telemedicine is defined as the delivery of healthcare services, where distance is a critical factor, using information and communication technologies for the exchange of health related information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, for healthcare providers, for health of individuals and their communities, thus the telemedicine reflects health care delivery at a distance place.

The National Telemedicine Taskforce by the Health Ministry of India, was established in 2005, and launched ICMR-Arogyasree, National electronic Health Authority (NeHA) and Village Resource Centres(VRC), for making family physicians by giving them easy access to specialty doctors and helping them in close monitoring of patients, with services like store and forward, real time, remote and self monitoring providing healthcare delivery and management, disease screening and health care during disasters and help facilitate healthcare system to a large segment of area and people.

Information technological development and Communication Satellites led to transfer patient images and videos, medical images like X-rays and scans, and real time audio and video consultations, and recording of electronic medical records. The Government of India has initiated critical networks for capturing information for Telemedicine such as the Integrated Disease Surveillance Project (IDSP), National Cancer Network (ONCONET), National Rural Telemedicine Network, National Medical College Network and the Digital Medical Library Network with technology evolved to use smartphone cameras, probes, sensors, wearable biosensors, drones, to capture health, surveillance and disease information. Some of the premier Medical Institutes in India like Sri Ganga Ram Hospital, Delhi, Regional Cancer Center Trivandrum, Sanjay Gandhi Postgraduate Institute of Medical Sciences, School of Telemedicine and Biomedical Informatics, Narayana Hrudayalaya, Apollo Telemedicine Enterprises, Asia Heart Foundation, Escorts Heart Institute, Amrita Institute of Medical Sciences and Aravind Eye Care. Some of Telemedicine health care practices are in the islands of Andaman and Nicobar and Lakshadweep, the hilly regions of Jammu and Kashmir, Medical College hospitals in Orissa and rural/district hospitals in other states.

New Specialties like tele-ophthalmology, tele-psychiatry, tele-cardiology, and tele-surgery, tele-radiology and tele-endoscopy, are coming up as new normal. The Telemedicine allowed

healthcare professionals to diagnose patients in remote locations over smartphones and video calls and has fast become a part of daily health care delivery in the country, with Startups namely Practo, Portea, and Lybate, and specialist Hospitals like Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGIMS), Lucknow and PGIMER, Chandigarh, Apollo, CARE, e Sanjeevani, Arogya Sethu, COWIN, Meddo Health etc, which facilitate remote medical checkups, emulate the real-life experience by giving patients the option of adding their regular doctor to the platform.

The Ministry of Health and Family Welfare(MoH&FW) and the MeITY, Government of India promote Telemedicine services in the country through a National Telemedicine Portal, in which the National Medical College Network (NMCN) , interlinking the Medical Colleges across the country with the purpose of e-Education and a National Rural Telemedicine Network for e-Healthcare delivery, implement the Green Field Project on e-health. The National Rural AYUSH Telemedicine Network operated to promote traditional methods of healing to a larger population through telemedicine.

Aerial surveillance found useful to track large gatherings, minimising physical contact, and monitoring narrow by lanes for possible spread of Covid-19 and also be used to spray disinfectants in public spaces and residential colonies.

Drones are used to deliver vaccines and medications to remotest parts in the country, which helped expeditious healthcare delivery. The Meghalaya State is the first State to use drones in health care delivery under the Drone Rules 2021, of the Ministry of Civil Aviation, and used extensively the public health logistics for it's difficult terrain and undulated topography road network.

Drones are now used for a range of telemedicine and health delivery purposes by Government and Hospitals, in the country , including search and rescue, surveillance, traffic monitoring, weather monitoring, firefighting, drone-based photography and videography. The potential applications of UAVs in healthcare include Prehospital Emergency Care, expediting Laboratory Diagnostic Testing and Surveillance, to deliver vaccines, haematological products and automated external defibrillators.

The use of drones in healthcare is still evolving but the potential is enormous, for providing real time data, monitoring patients, improving the quality of care, and even transporting drugs, making healthcare vaccinations and medications more accessible and convenient, even in distant places and disaster prone areas.

The Garuda Drone Services , a drone startups, in partnership with the food tech unicorn Swiggy engaged in drone grocery delivery, in addition to medicines and vaccinations, in Bengaluru and Delhi NCR., and has supplied drones more than 8,000 drones to countries like Malaysia, Panama, and UAE

The Government of India is proposing to develop as a Global Drone Hub by 2030, as India is fast emerging as the world's third-largest drone market, with an estimated expected turnover of the drone manufacturing industry to increase from ₹ 60-80 crore to ₹ 900 crore by FY 2024. It is estimated that the global drone market is poised to become a US\$ 54 billion market by 2025, with the drone manufacturing potential in India estimated as US\$ 4.2 Billion by 2025 and US\$ 23 billion by 2030, significantly contributing to Indian economy.

As per the Govt of India Drone Policy 2021, coverage of drones has increased to 500 kg from 300 kg, with liberalised incentives such as no unique authorisation number, certificate of conformance, certificate of maintenance and import clearance, unique prototype identification number, remote pilot instructor authorisation, operator permits, acceptance of existing drones, etc. for drone operators. Further a Single Window Online System known as the Digital Sky Platform is evolving with minimum human intervention, providing an interactive airspace map with green, yellow, and red zones that'll allow drone operators to plan their flights within safe corridors, with Green Zone no flight permission is required till 400 feet and up to 200 feet in the area within 8 to 12 km from an airport perimeter, Yellow Zone reduced from 45 km to 12 km from the airport perimeter. There is no registration, license, pilot license, no restrictions on import and operate drones under the New Drone Policy.

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Drones facilitate delivery of vaccines and medicines accessible and quicker to the remotest and difficult, and hazard-prone areas in the country, with requisite technologies equipped with supplies tailored according to the situation to save the lives of patients in critical conditions, delivering human organs for transplant etc.

Drones are capable of effectively delivering biologicals like serums, blood, viral culture, vaccines, and organs safely and securely help saving millions of lives, thus has the potential to mainstream the healthcare delivery in India.

In health care delivery, the last mile delivery is critical and drone facilitates quicker delivery of life saving medications, without any access restrictions.

Realising the potential of drone use in Telemedicine, the Indian Council of Medical Research(ICMR) has issued guidelines on June 2, 2022, for using drones in the healthcare sector to ensure universal access to medicines, vaccines, and other medical supplies, in the country.

There are initiatives to deliver blood in trauma events and in maternal/obstetric emergencies such as postpartum haemorrhage, in some African countries and has potential to be widely used in North Eastern region and the Himalayan region States of India. The Skye Air Mobility Indian drone delivery and logistics Startup, operate between Uttarkashi and Dehradun, for various drone based services, including telemedicine.

The Drone Response and Outreach for North East known as the i-DRONE is aimed for the NE Region aims to deliver vaccines and medical supply, in difficult geographical terrains including land, island, foothills and across the hills, connecting the district hospitals to the community and primary health care centres.

The medical supplies delivered under i-Drone project include vaccines used routine immunisation programs, antenatal care medicines, multi-vitamins, syringes and gloves, for delivery of life saving medical supplies.

Tata 1mg is operating drone delivery service in Dehradun and in other cities like Haridwar, Mussoorie, and Rishikesh, for delivery of medicines and collection of medical samples, at door step. AIIMS, Rishikesh has launched drone health care services in Uttarakhand State, with delivering medicine, vaccinations, blood samples, anti-tuberculosis drugs etc.

Apollo Tele Health Services is operating drone services for healthcare delivery services like

Prehospital Emergency Care, Laboratory Diagnostic Testing and Surveillance, in addition to deliver vaccines, haematological products and automated external defibrillators, identification of mosquito habitats and drowning victims at beaches as a public health surveillance modality. Extension education, IEC, advocacy and training, on drone based innovative health intervention, the sustainability of drone supported Healthcare systems for improving healthcare, in remote and underserved environments by supply of lifesaving medical supply, device delivery, and reducing costs of routine prescription care in rural areas.

The drone based Sky Health Care Delivery Project promoted by the World Economic Forum focuses on multi stakeholder engagement that drives meaningful conversations about methodology, explores challenges to current systems and unlocks opportunities for collaboration leadership between the public and private sectors alongside civil society, presenting a tremendous opportunity to address healthcare sector, reducing stockouts and wastage, deaths due to diseases such as dengue, conditions like postpartum haemorrhage, loss of blood due to accidents and help critical organ grafting through faster responses, higher-quality products and better availability and saves lives by adopting advanced logistics systems.

CONCLUSION

The last mile healthcare of future is expected to be by drones, catering to remote places, difficult terrain, disaster supply, time saving, cost effective, reliable, timely, with technologies which can be easily adaptable by doctors, hospitals, industry and by all. The disruptive drone technology has found applications in all fields and innovations in technology has facilitated critical health care delivery in most efficient and effective manner.

The world has harnessed technology to enable incredibly innovative outcomes, particularly in modern healthcare. One such example is drone technology, which, despite being initially designed for aerial and military use, has been embraced by innovators for another critical application: augmenting healthcare delivery.

Drones are an element to be taken into account when attending health emergencies as they significantly improve the distance travelled to locate accident victims, have the possibility of performing triage prior to the arrival of the health care units, and improve the time and quality of the care provided.

Quality healthcare and emergency medical delivery, to inaccessible locations, disaster medical supplies, are the essence in an emergency, with faster response would prevent medical trauma and potentially save lives, and prove great opportunities for impactful future. It is expected that geo and bio sensors, GPS, and many probes, surveillance and diagnostics, and AI applications will make drone applications an indispensable tool in Telemedicine sector most useful and affordable.

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