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# Technology of Drones and the Benefits to Health Care Delivery

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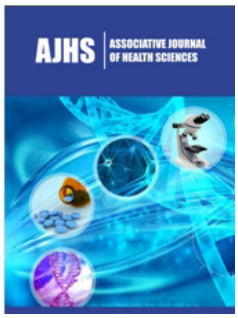


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## Introduction

Advances in technology have revolutionized the medical field and enhanced the delivery of health care [1]. In the 1990s, military organizations began to use drones, or unmanned aerial vehicles (UAVs) for several different operations. A drone is an aircraft without a human pilot onboard and controlled from an operator on the ground. The decline in the cost of manufacturing due to advancements in technology have allowed drones to become a viable option for a diverse range of services, including health services. Drones are making their way into the public and private sector and have the potential to have a major impact in the field of medicine and health. Health services and medical resources in underserved communities are limited to motor transportation and in-person interactions; however, drones may be a feasible alternative in providing selective health care in a more effective manner. Drones have been grouped into three categories relative to the application of health services:

1) Prehospital emergency care;
2) Laboratory diagnostic testing; and
3) Surveillance [2].

## Application & Benefits of Drones in Health Delivery

Current research has explored the use of drones for natural disaster relief, search and rescue missions, as well as unit transfer [3]. A temperature-controlled container has been designed by Johns Hopkins researchers to transport specimens, such as blood, lab tests, and vaccines to remote populations. Drones can also carry on demand medical supplies and medical devices, such as automated external defibrillators [4]. The U.S. Federal Communications Commission (FCC) has initiated a project to develop the telemedicine infrastructure in order to increase access to health care services in rural areas [5]. According to the Centers for Disease Control and Prevention (CDC), chronic diseases are the leading cause of death and disability in the United States and continue to be a major concern in terms of economic and societal ramifications [6]. Rural areas have distinct barriers regarding access to health care, such as transportation and availability of medical facilities. Drone-aided health care delivery and pickup for chronic disease patients in rural locations can increase access to needed services and medications. Additionally, aerial health care delivery can reduce out-of-pocket expenses for the patient, limit the need for several caregivers, reduce health disparities, and improve the overall quality of the health care environment for those living in rural settings [7,8]. Drones have also been utilized to identify mosquito habitats and detect other environmental issues. In 2017, during the hurricanes and tropical storms that pummeled Texas, Florida, and Puerto Rico drones realized some of their life-saving potential. During these disasters, drones surveyed broken down and demolished roads, bridges, and rail lines. UVAs identified oil and gas leaks and inspected cell towers that left many people unable to call for assistance [3].

## Conclusion

Research has shown that drones can enhance the delivery and access to health care for patients who would be restricted from adequate services due to cost, location, or infrastructure

[9,10]. The application of drones in health emergency situations around the world appears to be a promising and useful tool. Drone technology has the capability to both enhance the accessibility and quality of health care and medicine. As with every new technology, drones require the science and data to support the safety and efficiency of its usefulness. The great thing about technology is that every day we can find new discoveries that will change our minds about what is possible in the future. Let's reach for the stars!

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