

News and Perspectives

Drones in the (Pharmacy) Desert: Can Prescription Delivery via Drone Improve Health Care Access?

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Abstract

Access to medication is a challenge faced by millions; in addition to economic and social barriers, in many places, the physical infrastructure just doesn't exist. In this *News and Perspectives* article, JMIR Correspondent Jenna Congdon reports on expanding drone-based pharmacy initiatives that are helping to overcome this barrier across the United States and Canada.

Key Takeaways

- Pharmacy deserts limit medication access and contribute to health care disparities for millions, particularly in low-income urban and rural neighborhoods.
- Drone-based medication delivery is economically and environmentally cost-saving and can improve access, convenience, and medication adherence while expanding pharmacy reach and bolstering community health resilience.
- Successful implementation depends on overcoming regulatory, operational, and equity challenges, ensuring secure, patient-centered delivery that complements traditional pharmacy services.

Imagine needing an antibiotic or blood pressure medication, but the nearest pharmacy is in the next neighborhood over. The distance isn't walkable, and you don't have a car—your only option is a long public bus ride just to pick up your prescription. Worse, the pharmacy closes just before your shift ends, leaving you with a choice between missing out on paid work hours or getting there in time to get your medications refilled.

Or, imagine you live in a remote area, and the nearest pharmacy is an hour's drive away. Even with transportation, it's a significant investment to get your prescriptions refilled, and sometimes, the roads may be washed out or snowed in, blocking your way entirely.

These are examples of pharmacy deserts—areas where residents lack [reasonable access to a pharmacy, often defined as](#) greater than 1 mile in urban areas and greater than 10 miles in rural areas. One study found that [19% of residents in the Greater Toronto Area](#) lack reasonable geographic access to community pharmacies, while another showed that [4.7% of the US population](#) resides in a pharmacy desert. Lower-income communities in densely urban and remote areas are [most likely to be affected](#).

There are [many viable solutions](#) for improving medication access for people living in pharmacy deserts, from incentives for pharmacies that set up shop in neighborhoods that lack access, to expanded mail delivery programs, to remote dispensing pharmacies. But the most modern solution might be hovering just above your head—pharmacies are partnering with drone delivery services to fly meds to your doorstep.

Why Drones? The Real Question Is Why Not?

[Drone technology](#) is not new. These small, unmanned aircraft have been used for military purposes and remote supply drops for decades, with [consumer use](#) increasing sharply in the last 10 to 20 years. [Major companies](#) have been offering drone delivery services since the mid-2010s, though these programs are often limited to select geographical areas and delivery types. If you can have an online grocery purchase delivered to your doorstep via drone, why not also your medications?

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Drone delivery expands pharmacy reach without the huge investment required for the development of additional brick-and-mortar infrastructure.

[From Cleveland to Dubai, from Ghana to India](#), health care systems are increasingly relying on drones to address disparities in health care access and deliver needed medications and supplies, [aided by advances](#) in AI, cold-chain capabilities, secure delivery systems, and improvements in navigation systems and battery power. While there are drawbacks, drone technology is quickly becoming an appealing approach to health care delivery.

Ready for Takeoff: What One Hospital System Learned During the Launch of Their Drone-Based Pharmacy Delivery Program

In 2023, the Cleveland Clinic in Cleveland, Ohio, [announced their plans](#) to partner with drone delivery company [Zipline](#) to create a drone service as part of their pharmacy home delivery program. Set to launch in late summer 2026, the program will serve residents within a [5-mile radius of their Beachwood, Ohio, campus](#).

[Bri Brown Robinson, PharmD, MS](#), has led the effort to get the program off the ground. She shares that the program's mission is to "...improve access to care, specifically around our pharmacy services, to all of the patients that we serve, and increasing that reach [into] pharmacy deserts." The program will be at no additional cost to patients enrolled. Initially, it will serve a limited number of patients, with the goal of building a sustainable, scalable system.

Robinson recounts the many logistical hurdles her team has faced: "We do a lot of work around ensuring that we create really clear communication with our patients...our team, as well as the Zipline team, has done a lot of work with communicating with the different municipalities in the city, making sure that we're looking at all of those regulations and mapping out air space to ensure that we're complying with all of those regulations."

In addition to navigating airspace regulations, security and patient privacy are also key pieces. Robinson explains that each prescription will be filled as usual at the pharmacy, then placed into a secure lockbox, which will then be picked up by the delivery drone. The drone will be mapped during the entire journey to the patient's home, ensuring a safe drop-off. Patients can also track their deliveries via an app.

In Robinson's experience, most patients are receptive to the new technology. When offered the opportunity to opt in to drone delivery, she's seen mostly enthusiasm: "Everyone's excited. They're asking really, really good questions."

Communities in Canada Use Drones to Deliver to Remote Patients

In recent years, drones have been used to provide medical access to patients in remote communities. [Montana First Nation](#) and [Moose Cree First Nation](#) both partnered with [Drone Delivery Canada](#) to deliver needed medications to remotely located persons. In 2024, [Oak Medical Arts](#) in Thunder Bay worked with drone delivery service Script Runner to launch an AI-driven drone delivery service in an

effort to provide better health care access to those living far from urban areas.

Strengths and Challenges

Whether urban or rural, drones offer an [economically and environmentally friendly](#) method of door-to-door delivery that can help to address health disparities and support access to prompt medical care.

Despite these advantages, successful implementation requires navigating complex barriers. Regulatory hurdles, such as aviation regulations, often pose obstacles, while ensuring patient privacy and managing liability remain crucial pieces of the puzzle. Drone operators must also account for environmental variables like adverse weather, battery limitations, payload restrictions, and the logistics of safe, precise landing.

From a clinical workflow perspective, integrating drone delivery into existing pharmacy systems requires robust solutions for prescription verification, chain of custody management, and patient-to-clinician communication.

While drone delivery offers undeniable convenience, it must be viewed through the lens of digital health equity. Innovation can inadvertently widen disparities when infrastructure is uneven; these programs should be implemented with equitable access and culturally congruent care at top of mind. Drones are not necessarily a replacement for traditional pharmacy infrastructure or the human element of clinical care; they're an evolution of and addition to the current health care delivery system.

Drones on the Horizon: Looking Ahead

The future of drone medication delivery extends beyond simply dropping medication at your door. Having a reliable delivery system that does not require patients to leave the house can [boost medication adherence](#) for patients with limited mobility or who lack transportation, and drones carrying medical supplies can be [dispatched in urgent scenarios](#) to support public health resilience in the face of disaster. Drone delivery expands pharmacy reach without the huge investment required for the development of additional brick-and-mortar infrastructure.

Ongoing outcome research is critical to ensure these programs fulfill their promise. By centering community needs and maintaining a commitment to human-led care, we can ensure that drones help bridge the gap in pharmacy deserts across the globe.

Keywords: drug delivery systems; unmanned aerial vehicles; pharmacies; pharmaceutical services; medication adherence; health services accessibility; health care disparities; rural health services

Conflicts of Interest

None declared.

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