



Africa's Drone Medical Delivery Service Saves Lives in Lockdown

Could airborne despatch of medical supplies also be the answer to the needs of developed countries?

Ordering food deliveries online has become part of the new normal for millions of people in locked-down economies. In Africa, doctors are also placing orders remotely, but for a rather different kind of sustenance: blood.

The plasma is delivered by drones to far-flung communities in Rwanda and Ghana within minutes of the order being placed by text message, often in a context of life-and-death like childbirth gone wrong. They are the world's first national-scale solution for the healthcare and emergency needs of people living in places not served or hard to reach by land transport. What started with blood supplies and vaccines now also includes medicine, contraceptives and personal protective equipment (PPE).

As the Covid-19 outbreak wears on, drone despatches of medical supplies may be taking off in developed countries, too. On 22 May, **a drone delivered PPE and other supplies** to a hospital in Charlotte, North Carolina, in the first flight of its kind during a pandemic in the United States.

"We are basically stepping in and becoming the primary supplier to many of these smaller clinics," said Brittany Hume Charm, head of Global Health at Zipline, a Californian start-up that operates the drone delivery systems in Rwanda and Ghana as

well as North Carolina. She discussed the company's African services at a recent **webinar** hosted jointly by the Washington-based **Centre for Global Development (CGD)** and **INSEAD's Humanitarian Research Group**.

"An agile supply chain that is able to keep care going during Covid-19 is an unsung hero," said Charm. "I think what we're seeing now is something that can have benefits in an emergency and a routine context."

'Subway in the sky'

Drone delivery of medical supplies – one of the many **technological innovations being put to use ahead of their time** – may still be a novelty in the US, but for years now, people in Rwanda and Ghana have been seeing a battery-powered giant bird whizzing across the skies at 110 km per hour, rain or shine. Zipline launched its service in Rwanda in 2016 and in Ghana last year. In both countries, the service stems from a public-private partnership. Governments championed the launch and pay a service fee for ongoing operations; NGOs and companies including Gavi, the Vaccine Alliance, the Bill and Melinda Gates Foundation, Pfizer and the UPS Foundation provide aid and backing.

Zipline currently has two distribution centres that

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serve all of Rwanda and four in much larger Ghana. Each distribution centre is part medical warehouse, part droneport, and covers a delivery area of 22,000 km². All told, Zipline serves around 2,500 hospitals and other health facilities in the two countries. The star of the setup, of course, is the “Zip” – an unmanned aerial vehicle that has a service radius of up to 85 km, enabling the delivery of medical products from the distribution centres to hundreds of surrounding health facilities. The belly of the plane has a hatch that holds a package of up to 1.8 kg, in **cold chain** condition if necessary, and releases it in a pre-designated area right outside the recipient facility.



National authorities preapprove flight routes and have real-time visibility on the drones through upfront and regular communication with the company, said Charm. Up to 20 Zips can operate in a service area simultaneously. “The planes know exactly where they are going. It’s like an invisible subway tunnel in the sky,” she observed. “All of this ultimately serves some of the smallest, hardest to reach, most remote health facilities.”

Prashant Yadav, INSEAD Affiliate Professor of Technology and Operations Management and a CGD Senior Fellow who moderated the webinar, said the Zipline model could be part of the solution to challenges faced by medical supply chains during the pandemic. “The value of creating structure like what Zipline is doing in Rwanda and Ghana is also that, in times like Covid-19, it could deliver supplies which are needed in very fast response or short lead time.”

While Zipline claims the only **national-scale drone delivery programmes** known to exist, several other drone companies and start-ups including **EVA**, **Flytrex** and Matternet are launching or scaling up delivery and other logistical services during the Covid-19 outbreak as entire populations shelter in place.

Corona demand spike

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In multiple ways, said Charm, having set up an operational drone delivery system in normal times has enabled Rwanda and Ghana to respond quickly to challenges triggered by Covid-19 when **much of Africa came under and remains in various degrees of lockdown**. In the week after Ghana imposed its lockdown, noted Charm, Zipline experienced a four-fold increase in demand from health facilities when land transport became untenable. Besides ensuring that essential medical services like vaccination programmes don’t run out of supplies, Zipline also provides centralised inventory of products and supplies (important for facilities lacking onsite cold storage), data analysis of disease spread and product needs, forwarding of Covid-19 test samples, and delivery of critical supplies to quarantined populations.

In Rwanda, for example, Zipline despatches oral therapies to more than 40 cancer and leukaemia patients. In Ghana, the company’s distribution centres serve as collection points for Covid-19 test samples that are then flown to labs in cities, reducing the need for expensive and long ground trips by health workers. Charm highlighted that this marks the first time Zipline’s drones are venturing into densely populated urban areas, demonstrating the potential for drones to serve regions hitherto deemed out-of-bounds by local authorities.

The Covid-19 crisis has meanwhile expanded Zipline’s remit to family planning products. At the request of Ghana authorities, said Charm, the service has begun delivering contraceptives and condoms to hard-to-reach facilities in western Ghana, efforts that would ultimately help curb unwanted pregnancies, abortions and maternal deaths.

Luk Van Wassenhove, INSEAD Emeritus Professor of Technology and Operations Management and director of the Humanitarian Research Group, says the drone programme in Rwanda and Ghana exemplifies the sort of supply chain solutions that could be tested in developing economies that do not yet have established infrastructure or limitations.

“In Rwanda, you can fly your drones without many constraints, and that would be a lot more difficult in Manhattan,” he noted in a separate conversation with Knowledge. “So you can design new solutions (in developing countries), and maybe those solutions are useful if you bring them back to developed economies.”

Drone delivery by no means solves all the challenges of Covid-19 medical supply chains, Yadav made clear at the webinar, but it’s at least part of the solution. “There are many questions unanswered. It is worthwhile thinking what those questions are and how do we make sure that both

development partners and governments learn from their experiences and start communicating them faster to other governments.”

Prashant Yadav is an Affiliate Professor of Technology and Operations Management at INSEAD. His work focuses on improving healthcare supply chains and designing better supply chains for products with social benefits.

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