

RWANDA

The blood that arrives by air

In Rwanda, drones carry blood to remote hospitals. Studies show it arrives faster and saves lives.

WHERE	Muhanga
WHO	The doctors, nurses and engineers of Rwanda's drone blood delivery programme
WHEN	2016 to 2020

4 min read

CHAPTER ONE

The story

Rwanda is a small country of steep hills. A mother who bleeds heavily after giving birth can die within hours. A blood transfusion can save her. Severe malaria and serious injuries also need blood fast. But only a few clinics can store blood. For the others, blood had to travel by road over the mountains, and the trip could take hours.

In 2016, Rwanda became the first African country to bring drone deliveries into its health system. The government joined with Zipline, a California company that makes small drones with fixed wings. The first drone port opened in Muhanga in 2016. A second opened in Kayonza in 2019.

A hospital places an order by phone or text. Staff at the drone port pack the blood in under 10 minutes and launch the drone. It drops the package at the hospital's collection point and flies back on its own. Deliveries that once took hours now take 15 minutes to an hour.

> **Every second counts in an emergency.**
>
> MARIE PAUL NISINGIZWE, LEAD AUTHOR OF A UNIVERSITY OF BRITISH COLUMBIA STUDY

What the studies found

Researchers from the University of British Columbia and Rwanda studied more than 12,000 deliveries over two years. Blood arrived 79 minutes faster on average than by ambulance. Wasted blood units fell by two-thirds. The study appeared in The Lancet Global Health.

A separate study by the University of Pennsylvania looked at hospitals served by the drones. It found a 51 percent drop in deaths among mothers who bled heavily after birth. Deaths among trauma patients fell by 30 percent. Hospitals also kept less blood in stock.

79

minutes faster, on average, than delivery by ambulance

51%

fewer hospital deaths from bleeding after childbirth, the Penn study found

29

public hospitals served by the two drone ports in June 2020

Not equal for everyone

The Penn study found that hospitals closest to the drone ports gained the most. Those farther away saw smaller gains. One researcher said that better logistics do not always help every patient equally.

Rwanda has since added vaccines and medicines for HIV/AIDS, malaria and tuberculosis to the programme.

How it unfolded

- **2016** Rwanda becomes the first African country to use drones in health care. The Muhanga port opens.
- **2019** A second drone port opens in Kayonza.
- **2020** The two ports serve 29 public hospitals.
- **Now** Studies find blood arrives faster, less is wasted and fewer mothers die.

CHAPTER TWO

What makes it special

It is not the drone alone that saves lives. It is a phone call, a packed box, a fast flight and a team ready to act.

The researchers also showed who gained less. Good results do not always reach everyone equally.

OUR TAKE

In Rwanda, a mountain road became a short flight, and blood reached people who had waited the longest.

CHAPTER THREE

What we can learn

1 **Start from the real problem**

The problem was hours of travel over hills, not a lack of blood alone.

Try this: Name the exact delay or barrier in a problem before you look for tools.

2 Use technology to shrink distance

Drones cut trips that took hours to 15 minutes to an hour.

Try this: Ask whether a simple tool could remove a long journey in your work.

3 Measure the results

Two research teams counted deliveries, waste and deaths.

Try this: Track one number that shows whether your effort is working.

4 Check who is left out

Hospitals far from the drone ports gained less.

Try this: After a success, look for the people the benefit did not reach.

ONE THOUGHT TO TAKE AWAY

Speed saves lives most when it reaches the people who are far away.

Sources

University of British Columbia, Faculty of Medicine
Drones deliver blood faster in Rwanda (study in The Lancet Global Health)

HospiMedica
Medical Drone Program Improves Blood Access and Patient Survival (on a University of Pennsylvania study)

Wikipedia
Zipline (drone delivery company)

Fact-check note: The sources agree on the main story. The UBC page reports the Lancet Global Health study: more than 12,000 deliveries over two years, blood arriving 79 minutes faster on average than by ambulance, and wasted blood units down by two-thirds; it also says Rwanda in 2016 became the first African country to integrate drone deliveries into its health system, in a partnership between the Government of Rwanda and Zipline, and that deliveries have expanded to vaccines and essential medicines for HIV/AIDS, COVID-19, malaria and tuberculosis (the story names HIV/AIDS, malaria and tuberculosis). The quote is from the study's first author, Marie Paul Nisingizwe, as printed on that page. HospiMedica reports the University of Pennsylvania study, published in Manufacturing & Service Operations Management: first drone port in Muhanga in 2016 and a second in Kayonza in 2019; two ports serving 29 public hospitals as of June 2020; orders by phone or text; consignments prepared in under 10 minutes; deliveries that took several hours now taking 15 minutes to an hour; a 51 percent reduction in in-hospital deaths among mothers with postpartum haemorrhage, a 30 percent reduction among trauma patients, a 63 percent cut in red blood cell stock and a 40 percent cut in wastage; and that hospitals closest to the ports gained the most. The two studies give different figures for waste (two-thirds in the UBC study, 40 percent in the Penn study) because they measured different things; the story gives the UBC figure only for the first study and mentions only that hospitals kept less stock in the Penn study. Wikipedia confirms that Zipline began operations in Rwanda in October 2016 under a government agreement and that a second Rwandan centre opened in 2018; HospiMedica gives 2019 for Kayonza, and the story follows HospiMedica; Wikipedia's date may refer to a different expansion. "Drops the package at the collection point" and "flies back on its own" are from HospiMedica. The mountainous terrain and hours-long road trips are from HospiMedica; that only a few facilities can store blood is from the UBC page. We could not open the Wharton write-up (403) or the full research papers. Zipline is a private company, and we did not check whether any authors of the studies had ties to it. We did not check results after the periods the studies cover. The pin shows Muhanga. Lines marked "Our take" are interpretation. Everything else comes from the sources above.