I was there at Ebola’s bloody beginning

Forty years ago, Peter Piot raced to the scene of an outbreak of an unknown deadly disease. What he discovered gave him his life’s purpose.

By Tiffany O’Callaghan

WE DIDN’T know it would be in a Thermos flask, but we were warned by telex that a sample would be arriving from Zaire. It was blood from a nun who had died from a mysterious disease. Was it yellow fever? Something else?

The nun worked at a mission hospital in the north of the country, but had been evacuated to the capital Kinshasa before she died. Her doctor put the samples in a small blue Thermos – the kind people use for coffee – and gave it to a pilot. He carried it in his hand luggage, and brought it to us at the Institute of Tropical Medicine in Antwerp. He did it all without gloves, without anything. Today he’d go to jail. But he didn’t know what he was carrying – nobody did.

We opened the flask and found two glass vials swimming in water and ice. One had cracked, so there was also some blood in the slush. We were certified to work with
viruses transmitted by insects, like yellow fever, but we weren’t equipped for highly dangerous pathogens. We took precautions: wore rubber gloves, lab gowns and so on,
and manipulated the samples in a way that was as sterile and safe as possible. But we were lucky, frankly.

Today, isolating viruses is straightforward – biologists go straight to the genome. But in 1976 it was more craft than science: injecting samples into mice and waiting for odd behaviour; putting sample fluids on to cell lines and looking for tell-tale gaps in the tapestry they form, like a hole in a stocking.

We did tests to rule out known viruses and viewed the inactivated virus with an electron microscope. That’s when we saw it was something new: most viruses are spheres or cubes, but this was like spaghetti. The only other virus with a similar shape was Marburg virus, so we called it “Marburg-like virus”.

We weren’t able to do more work though. A telegram from the World Health Organization said the nun appeared to be part of an epidemic of a haemorrhagic fever, and it had a high death rate. The samples went to the Centers for Disease Control in Atlanta, which had the highest biosafety rating. There Karl Johnson’s team checked to see if Marburg antibodies would react to the Marburg-like virus. They didn’t, confirming it was a new virus.

**Into Africa**

I was excited that we had isolated something new, but even more eager to find out how it was transmitted. What does it cause? And how? I wanted to go to Zaire (now the Democratic Republic of the Congo) to have a look. Within a week I got a call from the Department for International Development in Belgium asking me to fly to Kinshasa to investigate the epidemic. Now, I definitely wasn’t qualified. I had never been to Africa, I had never investigated an epidemic, and I was still very young. I immediately said yes.
On arrival, my colleague Stefaan Pattyn and I went straight to a meeting of the commission investigating the epidemic. The big worry was that the epidemic could spread in Kinshasa, a chaotic city of about 3 million people. Later that day it was decided that some volunteers should fly to the epidemic zone, to ground zero – a
village called Yambuku where the mission hospital was. I raised my hand.

A village close to Yambuku and the mission hospital where the outbreak started
Peter Piot

Six of us went out to Yambuku, led by Joel Breman of the CDC. Our aim was to stop the epidemic. First we had to work out how it was transmitted. Pierre Sureau and I teamed up to examine sick people, taking blood and gathering information about age and gender, date of symptoms onset and exposure to other infected people. When you don’t know the cause of an epidemic, you must define it in terms of three things: time, place and person. For time, where are you in the epidemic? Has it peaked? For place, where are the victims coming from? And person: who is coming down with the virus we would later call Ebola?

When we arrived, the epidemic seemed to be declining. So what had happened? We learned that the hospital where the nun had worked had been closed down. That was one clue. Then we found out that the closer people lived to that hospital, the higher their risk of dying from Ebola. And when we looked at age, we saw that it was mostly fairly young adults who were affected, and also some newborns. So it probably wasn’t transmitted by mosquitoes – they bite everybody.

Also, twice as many women were infected as men. We wondered what was different about the women. As a group of six men it took us longer than it should have done to realise – women get pregnant. Indeed, many of the women who became ill were pregnant or had just given birth. These women had been to the antenatal clinic at the hospital, where just about every woman got an injection – with constantly reused needles and syringes.

We also saw that a large number of those who became ill were healthcare workers. So after a frantic 72 hours or so, we were putting the puzzle pieces together: time, place and person all pointed to the mission hospital.
We learned one other thing, too. The people in the villages kept telling us that about a week after a funeral of someone who had been sick, several cases would develop among the family members or other funeral attendees. Later, it was documented that the traditional funeral rites – when the corpse is washed with bare hands – are very high risk because the corpse and bodily fluids are full of virus. So, after those few days, we reached a few conclusions (later confirmed): the virus required very close contact or injections to be transmitted.

**Personal peril**

We saw several people in the final stages of their lives, but we had no way to provide intensive care. That was tough. We were also aware of the risk to ourselves. The mission hospital employed about 18 nurses; 11 of them died from Ebola. In the 2014 outbreak in West Africa, over 500 hospital workers died.

We didn’t have the kind of safety gear that you see now, but we did protect ourselves with latex gloves and paper masks and motorcycle goggles. I wasn’t really scared at the time, but afterwards I got scared looking back on it. About 300 people died during that first outbreak.

Since that first time, there have been about 25 outbreaks. Only the 2014 outbreak really got out of control. The difference then was that Ebola was in big cities, and when that happens we are in deep trouble. We needed a quick mobilisation, but the world did not react fast enough. When it finally did, there were rapid results. That’s a lesson for next time an outbreak threatens to become an epidemic.

And outbreaks will keep coming, despite what my professors warned me in 1974 when I
graduated from medical school. They said there was no future in researching infectious diseases, because they were dying out thanks to antibiotics, vaccines and improved sanitation. I did it anyway. Then the arrival of that Thermos changed everything. Those few months I spent racing against an epidemic gave me the beginnings of my purpose in life.

**Peter Piot recalls how Ebola got its name**

We had been referring to the virus as the Yambuku virus, after the village where it originated. But one evening, as we were talking about that day’s work, one member of our six-person team, Joel Breman, reminded us that naming killer viruses after specific places can convey a stigma. Karl Johnson, another member of the team, liked to call his viruses after rivers – he felt that took some of the sting out of the geographic finger-pointing. But we couldn’t call our virus after the majestic Congo river – for one thing, a Congo-Crim virus already existed. Were there any other rivers near Yambuku? We charged en masse to a not-very-large map of what was then Zaire pinned up in the corridor where we were staying. At that scale, it looked as though the closest river to Yambuku was called Ebola – “black river” in the local language. It seemed suitably ominous.

Actually, there is no connection between the haemorrhagic fever and the Ebola river. Indeed, the Ebola isn’t even the closest river to the Yambuku mission. But in our entirely fatigued state, that’s what we ended up calling the virus: Ebola.
Profile

**Peter Piot** is a clinical microbiologist and director of the London School of Hygiene and Tropical Medicine. He has been undersecretary general of the United Nations, and executive director of UNAIDS. He is the author of *No Time to Lose: A life in pursuit of deadly viruses* (W. W. Norton, 2012)

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