

# Sniffer 'hero rats' saving lives in war zones

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An African rat sniffs out a landmine in Chimoio, Mozambique. Light and with an acute sense of smell, giant African pouched rats have been found to be a highly effective weapon in the struggle to detect mines and a town in Tanzania is now at the forefront of a campaign to train the creatures in ordnance clearance.

A baby rat in a tiny red and black harness twitches its pointed nose incessantly, probing a grassy field where it is being trained by a pioneering Dutch NGO to smell out deadly landmines.

Other rats trained under the same scheme have already helped clear large swathes of land in neighbouring mine-infested Mozambique.

Babette, the two-month-old baby, walks unsteadily across the weedy patch followed by two trainers rolling a bar that teaches her to go back and forth across the patch in straight lines.

Light, with an acute sense of smell and easily motivated by food rewards, giant African pouched rats have been found to be highly effective in mine detection by APOPO, the Dutch non-governmental organisation that launched the training project -- the first of its kind -- in this Tanzanian town.

The rodents are trained to detect the TNT in landmines through Pavlovian conditioning: a click sound to signal a food reward whenever they make the correct detection.

Other rats in the same project undergo a different type of training -- they learn to sniff out tuberculosis in laboratory sputum samples, providing a second-line screening for hospitals in Tanzania where lab testing has 60 percent accuracy.

Training begins at four weeks old when the baby rats are exposed to humans to rid them of their fear of people and new surroundings, after which they are taught to associate a click sound with food.

Once that is achieved, they are then trained to distinguish TNT scent from other smells. When they successfully distinguish it, the click is sounded and they are given a bit of banana, thus reinforcing the link between positive [TNT](#) identification and food.

In all, it takes nine months of painstaking on- and off-field training for a rat to be deployed for mine detection.

"This work is not easy," recounts trainer Abdullah Mchomvu, holding a rat cage under his left arm. "You have to be patient. Sometimes I get frustrated, but then again I tell myself these are animals."

But "this work saves lives," he added.

It takes two deminers a day to clear a 200 square-metre (2,150 square-foot) minefield, but if they work with two rats they can sweep it in two hours.

"Detection is the most difficult, dangerous and expensive part of mine action. Since rats are much easier to train than dogs, rats in this environment are much more appropriate," said Bart Weetjens, the founder of APOPO.

"They are very effective. We have very high success rates. So far they have helped re-open almost two million square metres of land" in Mozambique.

In the lab, the rats use their keen noses to positively identify tuberculosis sputum samples.



A Sri Lankan mine clearance officer working with the Swiss Foundation for Mine Action shows a diffused anti-personnel mine in scrubland close to Mannar in the former war zone of the island state. It takes two deminers a day to clear a 200 square-metre (2,150 square-foot) minefield, but if they work with two rats they can sweep it in two hours.

Ten samples are slotted into the bottom portion of a long rectangular glass cage containing one trained rat. The animal sniffs each sample and scratches intently over any suspect sample, with a laboratory technician looking on and taking notes.

It takes a fully trained rat less than 10 minutes to sniff through 70 samples with high accuracy. Samples found negative for tuberculosis by the hospitals are at times proven positive by the rats and a second lab testing.

"In hospitals we work with, we have increased their detection rate by about 40 percent," said Dian Kuipers, a lab supervisor with APOPO.

Kuipers explained that in September alone they found 69 positive tuberculosis samples that were missed by hospitals and since the programme started three years ago more than 1,500 TB infections initially missed by microscopes have been detected with the help of the rats.

"You have to be pretty sick for the bacteria to be detected" in hospital laboratories, she said.

Tuberculosis is the deadliest opportunistic disease among HIV patients. In Tanzania, less than half of people with active TB are diagnosed before they die and every undetected case cause infections to up to 15 people every year.

However, rats here are seen as vermin that spread disease and destroy harvests.

"Rats absolutely have an image problem. People don't like them and that is one of our biggest struggles," said Weetjens.

"We are trying to change that perception. Rats are very sociable, very intelligent highly likeable creatures."

APOPO calls its sniffers "hero rats" in recognition of the work they perform.

The organisation's website pictures rats that could be straight out of Beatrix Potter: all pink noses and quivering whiskers.

APOPO has even launched an Adopt-a-Rat scheme where individuals and corporations can contribute to the upkeep and the training of a sniffer rat, receiving in exchange an adoption certificate and email updates on the animal's training or career.

Weetjens said the next frontier would be to use the "hero [rats](#)" to sniff out narcotics or to search for survivors of disasters such as earthquakes or collapsed buildings.

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