

# What is Novichok? The Salisbury poisoning nerve agent that's more potent than VX gas

**Source:** telegraph.co.uk

The nerve agent that poisoned Sergei Skripal, his daughter Yulia and now a couple in Amesbury is one of the most deadly chemical weapons ever developed and was produced in secret by the former Soviet Union.

Variants of the nerve agent Novichok are reported to be up to eight times more effective than VX nerve gas, that was deployed in the assassination of Kim Jong-nam, the estranged half brother of the North Korean leader Kim Jong-un in February 2017.

One of Novichok's developers - a Russian scientist Vil Mirzayanov who fled to the US after turning whistleblower - has said one of the variants had no known cure.

Scientists at the defence laboratory at Porton Down, just seven miles from Salisbury, identified the use of Novichok as the weapon used in the attempted murder four months ago of Colonel Skripal, 66, a Russian double agent who sold secrets to MI6, and his 33-year-old daughter.

On Wednesday, police said tests carried out at the Porton Down had established that Charles Rowley, 45, and his girlfriend, Dawn Sturgess, 44, had also been exposed to Novichok.

Novichok - meaning 'newcomer' or 'new guy' - was developed in labs in the old Soviet Union from the 1970s through to the early 1990s. It is so sophisticated only a state would have the capability of manufacturing it - and only Russia has done so.

That explains why Theresa May was able to say with certainty that the attempted assassination of Col Skripal was either ordered by the Kremlin or else the regime bears responsibility for allowing the chemical weapon to be stolen from its secret laboratory.

Philip Ingram, a former intelligence and security officer who has studied chemical warfare, said: "Novichok is a super, fourth generation chemical weapons that was deliberately designed to avoid standard Nato detection and defence mechanisms.

"It is highly lethal and can only be produced in some of the most sophisticated state run laboratories."

Novichok's existence was only disclosed by a Russian scientist turned whistle blower who went public in 1992 in the aftermath of the fall of the Soviet Union.

Dr Mirzayanov, who worked on Novichok for 27 years, was arrested for treason but the case was dropped because any trial would force the Kremlin to admit it had secretly developed an illegal chemical weapon in contravention of international warfare treaties.

Dr Mirzayanov, who fled to the US in 1995 fearing his life was in danger, said the Russians had developed enough Novichok to kill "several hundred thousand people".

Novichok, explained Dr Mirzayanov, is a 'binary' product that created nerve agents out of two 'harmless' substances that when mixed together created a powerful poison.

By tweaking the structure of agents, scientists hoped to create poisons that were more deadly to the victim, but safer to those deploying them. The tweaks also meant they would not show up in standard tests for better known chemical weapons.

The Russian labs created two types of Novichok nerve agent - A-230 and A-232.

Dr Mirzayanov, writing in 2009 in CBRNe World, a magazine for scientists working in the nuclear and chemical weapons industry, wrote: "Why are Novichok agents so dangerous? First, agent A-230, which was adopted as a chemical weapon by the Russian Army, is 5-8 times more poisonous than VX.

"It is impossible to cure people who are exposed to it. Next agent A-232... is a phosphate, like many pesticides. Phosphates are not listed among the controlled chemicals on the Chemical Weapons Convention lists."

Prof Andrea Sella, an inorganic chemistry expert at University College London, said the Novichok agents were designed to be made active before use by mixing two less dangerous ingredient chemicals.

The two-stage process meant it was safer to prepare and deploy by the user, but it also meant it could potentially be transported or smuggled more easily, he said.

He told the Telegraph: "You could bring two relatively harmless compounds that could be explained away in other ways. Then you mix them together and off you go.

"The Novichok programme was aimed at making sure that the compounds were less fragile and harmful than some of the other ones."