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Rapid report

Biowarfare scare: Pakistani judges under threat from suspicious substance

Damian Honeyman[1], Atalay Goshu Muluneh[1,2], Fatema Kalyar[3], Chandini Raina MacIntyre[1,4]

[1] Biosecurity Research Program, Kirby Institute, the University of New South Wales, Sydney, Australia.

[2] Department of Epidemiology and Biostatistics, Institute of Public Health, University of Gondar, Gondar, Ethiopia.

[3] School of Population Health, Faculty of Medicine, University of New South Wales, Sydney, Australia.

[4] College of Public Service & Community Solutions, and College of Health Solutions, Arizona State University, Tempe, United States.

Abstract

On 2 April 2024, Islamabad High Court and Supreme Court judges in Pakistan received threatening letters laced with an unknown substance, which was later alleged to be *Bacillus anthracis*. This event marked the third possible occasion where *bacillus anthracis* has been weaponised in Pakistan. Worldwide, *Bacillus anthracis* has been weaponised at least ten times prior to this suspected event. Whilst anthrax is endemic in parts of Pakistan and there are biosafety level 3 laboratories in the country, there is the possibility that *Bacillus anthracis* spores could have been harvested or acquired in the country. However, with limited information and no official confirmation from international sources, significant uncertainty remains around the unknown substance being *Bacillus anthracis*. Determining the true nature of the attack will require unrestricted access to relevant sites, data, and resources within the country by independent observers and international organisations to examine whether it was anthrax and, if so, how *Bacillus anthracis* was weaponised. This attack with a potentially lethal substance underscores the critical importance of robust biosecurity measures.

On 2 April 2024, eight threatening letters containing a suspicious white powder were received by Islamabad High Court and Supreme Court judges in Pakistan (1, 2). The following day, five judges from the Supreme Court, as well as judges from the Lahore High Court, also received threatening letters again containing a suspicious toxic chemical (1). On 5 April, ten more suspicious letters were intercepted, containing a suspicious toxic chemical and threatening content. This time, many were addressed to high-ranking officials, including Prime Minister Shehbaz Sharif (3). One report stated that a judge's staffer had accidentally dropped an envelope containing the suspicious powder. They started feeling extreme irritation in the eyes and burns on the skin around their lips, which are not symptoms of anthrax (4).

Within the envelopes alongside the white powder was a letter written in English criticising the 'justice system of Pakistan' with the phrase "Welcome to *Bacillus anthrasis*" (sic). The perpetrators accused the judiciary of 'pretending to do justice' and claimed the struggle for petty politics and vested interests would not be tolerated anymore (5). Immediate investigations stated judges received 'anthrax-laced letters' prompting the deployment of three different teams from the Counter-Terrorism Department to investigate further. Forensic investigations later confirmed the white powder to be *Bacillus anthracis* and 70mg of arsenic (3). However, this report is not publicly available. The letters also referenced 'Tehreek-e-Namoos Pakistan', a group that came to public attention in September 2023 after a bag containing a letter, weapons and ammunition, and maps of sensitive buildings targeted to attack judges and military officials was found on a hiking trail in Islamabad (3).

Various news outlets also reported that before the aforementioned forensic investigations, the suspicious white powder was not *Bacillus anthracis* but contained 'carbohydrates having arsenic traces' (6). However, days before the letters were received, it was reported that judges from the High Court had raised questions about the functioning of Pakistan's intelligence agency, ISI, by outlining incidents of intimidation and

interference by the intelligence agency (7, 8). Reports state that the former chief justice of Pakistan was due to head a one-man enquiry commission formed by the government to investigate the claims raised by the Islamabad High Court judges about the interference by the intelligence agencies (9). The Islamabad High Court judges alleged that their bedrooms were bugged and their relatives had been abducted and tortured by the intelligence agencies personnel to get the desired verdicts (9). The letters have since been traced to a general post office in Rawalpindi, and a post box has been identified (10). Reportedly, each letter was signed off with "Resham" without registration of an address, yet the actual sender remains unknown (7). Closed-circuit television monitoring was reportedly absent from surrounding the post office, which has hindered identifying the perpetrators (1).

In 2001, a report indicated that sketches of a helium-powered balloon bomb intended for anthrax dispersion were discovered in the Kabul office of an NGO led by a Pakistani scientist (11). Pakistani authorities dismissed any allegations related to this discovery, and it is worth noting that the individuals involved are widely regarded as pseudo-*Bacillus anthracis* scientists in Pakistan (11, 12). A letter containing spores also arrived in Karachi, Pakistan, addressed to a software company in the same year (13). Then, in November 2001, two men were arrested after being suspected of sending a letter containing *Bacillus anthracis* to Pakistan's largest newspaper, Daily Jang (14, 15). In October 2011, the then-prime minister, Yousaf Raza Gilani, received a threatening letter laced with *Bacillus anthracis* (16).

Anthrax is primarily a zoonotic disease caused by *Bacillus anthracis,* which has been described since the fifth Egyptian plague (circa 1500 BC), killing livestock and humans (17). Anthrax infection occurs in humans through either cutaneous, inhalational, or gastrointestinal routes and typically through close contact with animals or animal products contaminated with *Bacillus anthracis* spores (18). Inhalational anthrax has a mortality rate approaching 100% if left untreated (19). While human-to-human transmission does not occur, *Bacillus anthracis* can be easily used as a weapon with technical knowledge. Furthermore, while the disease remains endemic in many areas around the world, it continues to pose a threat as a mass-casualty-producing biowarfare weapon.

Bacillus anthracis was first weaponised during World War 1 by German forces, where infected horses, mules and cattle were sold to British and Indian armies before the United States entry into conflict (20-36). The Japanese 'Unit 731' then used *Bacillus anthracis* against prisoners of war during the Second World War (37). In one of the most extensive germ warfare experiments between 1941 and 1942, *Bacillus anthracis* was disseminated on Gruinard Island, Scotland (38). This testing event left the tiny island uninhabitable for decades. During the Rhodesian Civil War, *Bacillus anthracis* was deliberately introduced by Rhodesian Military Forces, resulting in the largest recorded outbreak in humans, with 11,000 infections and 182 fatalities (36). Whilst many biological warfare programs across the world studied *Bacillus anthracis,* the most well-documented accidental leak from a laboratory occurred in Sverdlovsk, the Soviet Union, in 1979, resulting in at least 79 infections and 68 fatalities (39, 40). In 1981, the "Dark Harvest" group conducted a symbolic act by deliberately placing soil from Gruinard Island, contaminated with low concentrations of Bacillus anthracis, along the London-Exeter railway line (27). In 1993, The Aum Shinrikyo sect attempted to disseminate *Bacillus anthracis* spores in an attack against Tokyo (41, 42).

The turn of the century saw further deliberate attacks with *Bacillus anthracis* in a covert fashion via letters sent in the post, firstly in the United States in 2001, resulting in 22 infections (11 inhalational and 11 cutaneous) and five deaths across five geographic areas (43). Most recently, in 2019, religious extremists allegedly sent 19 letters containing *Bacillus anthracis* spores to government officials, journalists, and trade unionists in Tunisia (44). However, this event remains unsubstantiated.

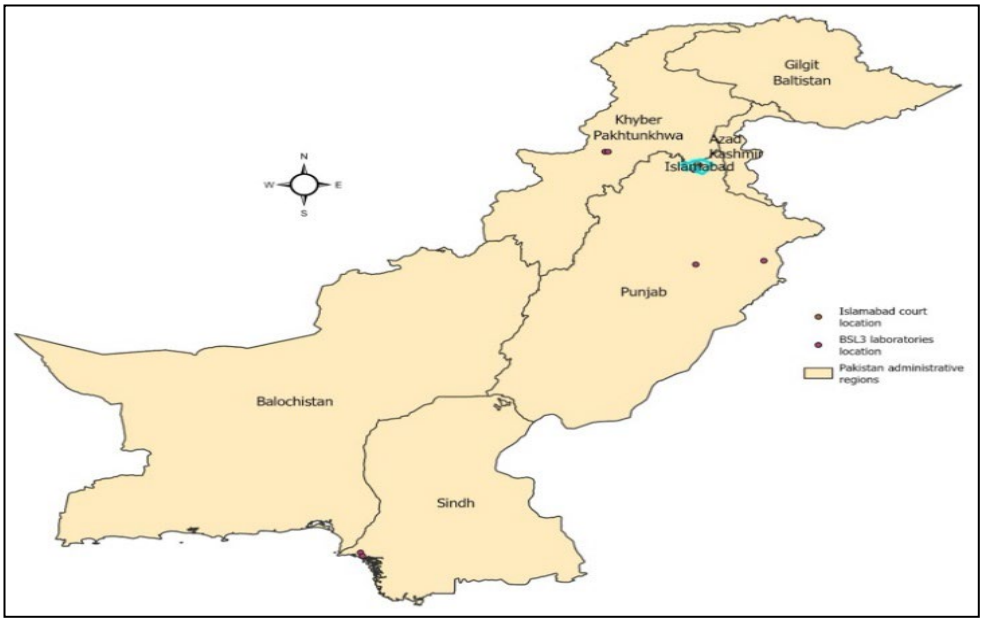
History shows that *Bacillus anthracis* spores have been weaponised by non-state actors (41), yet we have also seen a state actor who developed weaponised *Bacillus anthracis* spores that leaked from a laboratory (39). Anthrax may be seen as a preferred bioweapon due to its ease of use, in that it can be covertly hidden and shipped directly to

an intended target (19). When unsuspecting victims open their mail, their immediate thoughts are unlikely to be about the contents being dry concentrated *Bacillus anthracis* spores. Furthermore, anthrax is relatively easy to produce, it has a long shelf life and is stable in the environment (19). Additionally, *Bacillus anthracis* spores have a high survival rate and can linger for extensive periods of time, requiring contaminated areas to undergo intensive decontamination procedures.

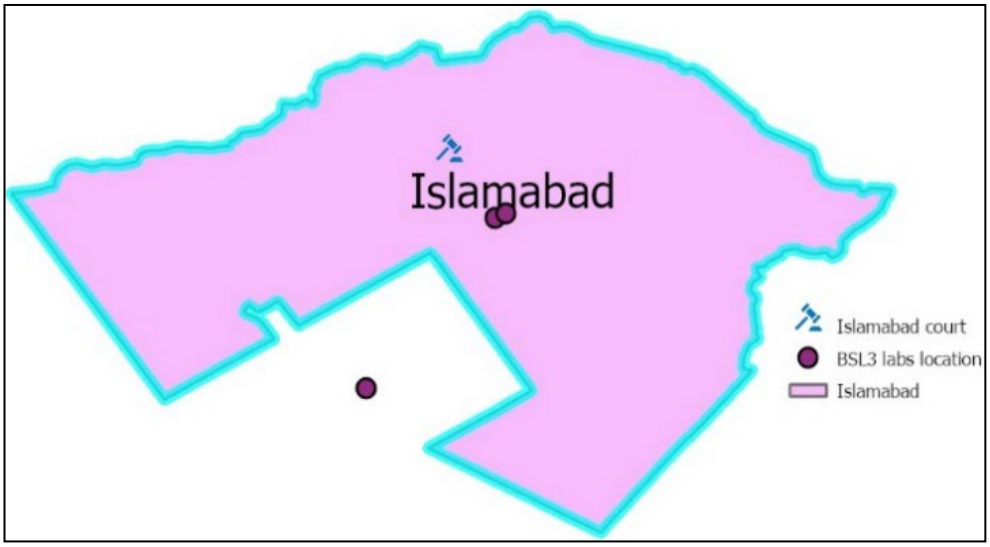
It is unclear whether the substance in the envelopes was *Bacillus anthracis.* If it is, the source may be spores harvested from the environment or a laboratory within proximity to the incident (45, 46). Forensic laboratory investigation can differentiate weaponised anthrax from unmodified anthrax. While anthrax is considered endemic in several regions of Pakistan, including the provinces of Baluchistan and Khyber Pakhtunkhwa (47), these areas could also be sources for the *Bacillus anthracis* spores.

Pakistan has Biosafety Level 3 (BSL3) laboratories, including the National Institute of Health in Islamabad, that has the capacity to store *Bacillus anthracis* and other high-risk pathogens (48). Other BSL3 and military laboratories such as Al Razi Main Laboratory, Al Razi Healthcare (Abu Dhabi group), Lahore; Armed Forces Institute of Pathology (AFIP), Rawalpindi, Punjab; and Aga Khan University, Sindh are some of the high-containment laboratories with capacity to work with *Bacillus anthracis* (49, 50). Although these biosafety laboratories in Pakistan are presented as a possible source, there is no supporting evidence of their involvement in accidental or deliberate breaches. The *Bacillus anthracis* spores may have been sourced from other countries or harvested spores from the environment.

It was reported that a female university professor from Jamshoro University in Sindh province, Pakistan, was the perpetrator of the 2011 anthrax letter sent to the Pakistan prime minister (14, 51). It remains unknown where the university professor obtained the *Bacillus anthracis* used in this attack, whether it came from the university or a nearby lab in Sindh. The two BSL3 laboratories, the Pakistan National Institute of Health Laboratory and the National Veterinary Laboratory (NVL), Chak Shahzad, Islamabad, were located in Islamabad, where the Islamabad court, the recipients of the anthrax threat letter were found (Map 1 and 2). As evidence pointed out, the National Institute of Health Laboratory in Islamabad is a reference centre for anthrax-related diagnosis and research (48). Hence, the reference laboratory may be one possible source of the *Bacillus anthracis* spores.



Map 1: BSL3 Laboratories and Islamabad court's location in Pakistan



Map 2: Islamabad court and BSL3 laboratories in Islamabad, Pakistan.

The current attack in Pakistan highlights the very real threat that anthrax could be used as a weapon of choice due to accessibility. Determining the true nature of the attack will require unrestricted access to relevant sites, data, and resources within the country by independent observers and international organisations to examine whether it was anthrax and, if so, how *Bacillus anthracis* was weaponised. In history, we have seen the weaponisation of anthrax in the United States and an accidental leak from a laboratory in Sverdlovsk kill innocent people.

Furthermore, the recent attacks in Pakistan underscore the critical importance of robust biosecurity measures. The example of Aum Shinrikyo, which was thwarted in its attempts to use *Bacillus anthracis* effectively due to acquiring a non-lethal strain, illustrates the potential of strategic biosecurity to neutralise bioterror threats. By enhancing physical security, tightening control over access to dangerous pathogens, and advancing detection and treatment capabilities, we can mitigate the risks associated with biological attacks (52)

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