

Epidemic response performance in contested territory: a comparative analysis of Ituri and North Kivu during the 2026 Bundibugyo virus disease outbreak

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Abstract

Background.

The 2026 Bundibugyo virus disease (BVD) outbreak in the Democratic Republic of the Congo (DRC) is unfolding across provinces under materially different governance and security conditions. Ituri, the outbreak's epicentre, remains under national government administration despite insecurity; North Kivu's capital, Goma, and surrounding territory have been under March 23 Movement (M23)/Alliance Fleuve Congo (AFC) control since early 2025. Existing published accounts treat insecurity as a generic, undifferentiated risk factor rather than isolating the specific contribution of contested territorial control.

Methods.

We compared Ituri and North Kivu on cumulative case fatality, health-zone coverage, and contact-tracing completeness using published, province-disaggregated surveillance figures from WHO, ECDC, and Africa CDC, contextualised against the documented conflict-related disruption of DRC's tenth Ebola outbreak (2018–2020), which affected the same two provinces. Two-proportion z-tests with 95% confidence intervals were used to test whether observed differences exceeded what chance alone would produce; the analysis is presented as hypothesis-generating throughout, consistent with the limits of an ecological design.

Results.

As of 7–8 August 2026, Ituri had reported 3,636 confirmed cases and 1,551 deaths (case fatality 42.7%) across 28 of 36 health zones; North Kivu had reported 470 cases and 315 deaths (case fatality 67.0%) across 12 of 34 health zones. North Kivu's contact-tracing follow-up (74.7%) fell below both the national figure (79.2%) and the 90–95% interruption threshold. The outbreak reached 1,000 confirmed cases within 40 days of response activation, versus approximately 235 days for the 2018 outbreak in the same geography. The North Kivu-Ituri case-fatality gap (24.4 percentage points; 95% CI 19.8–28.9; $z = 9.98$, $p < 0.001$) was too large to reflect chance, but North Kivu's case fatality did not differ significantly from the 2018–2020 outbreak's final case fatality in the same geography (67.0% vs 66.0%; 95% CI -3.6 to 5.5 percentage points; $p = 0.67$), while Ituri's was significantly lower than that historical benchmark (42.7% vs 66.0%; $p < 0.001$), leaving epidemic-phase and case-ascertainment explanations fully consistent with the data.

Conclusions.

Contested territorial control is associated with, though not proven to independently cause, weaker outcome-linked response indicators; the gap is statistically robust but equally consistent with epidemic-

phase and case-ascertainment differences, so this hypothesis-generating finding requires confirmation by time-matched, health-zone-level study before being treated as causal. Financing and access-negotiation strategies should be differentiated by governance geography, drawing explicitly on the documented lessons of the 2018–2020 outbreak in the same provinces.

1. Introduction and background

The Democratic Republic of the Congo (DRC) has now experienced seventeen recognised Ebola outbreaks since the virus was first identified near the Ebola River in 1976, more than any other country (1). Ebola virus disease is a severe, often fatal illness caused by viruses of the family Filoviridae, of which Bundibugyo virus is one of six recognised species (2). The 2026 outbreak, caused by Bundibugyo virus (BDBV) rather than the more familiar Zaire ebolavirus, was declared on 15 May 2026 in Ituri Province, was declared a public health emergency of international concern under the International Health Regulations two days later (3, 4), and within three months had become the largest Ebola outbreak ever recorded in DRC, surpassing the 2018–2020 Kivu epidemic (5, 6). The clinical and public health dimensions of the response have been reviewed elsewhere (7). By early August 2026 it had also become the fastest-growing Ebola outbreak on record by at least one benchmark: it reached 1,000 confirmed cases within 40 days of response activation, versus approximately 235 days for the 2018 outbreak (8).

This outbreak is being fought on two fronts simultaneously: an epidemiological one, and a security one. Ituri Province and North Kivu Province, its principal secondary front, are both affected by active armed conflict, but not in the same way or degree. Multiple armed groups, including the Allied Democratic Forces (ADF), the CODECO militia coalition, and the Rwanda-backed M23, operate across both provinces and have long constrained humanitarian access (9). What distinguishes North Kivu is a governance configuration with no real precedent in prior filovirus responses: since capturing Goma in early 2025 and expanding into Bukavu and Uvira, the AFC/M23 coalition has established a parallel administration headquartered in the province's largest city, operating alongside, rather than in coordination with, national health authorities (10, 11). Ituri, while also affected by insecurity, displacement, and armed-group activity tied to artisanal mining, has not experienced the same degree of territorial exclusion of the national government (9).

Existing published accounts of this outbreak's response performance analyse financing and personnel constraints in aggregate, and describe insecurity, displacement, and mining-related population movement as generic risk factors present 'in areas affected by' the outbreak, without isolating their differential effect by governance status (9, 12). This is a consequential gap. If contested territorial control carries a specific, quantifiable operational cost distinct from insecurity in general, then response strategies calibrated to national or even provincial averages will systematically misallocate resources, treating a structural access problem as if it were a resourcing problem that additional funding alone could resolve.

This analysis has two aims: to isolate, using only published province-disaggregated surveillance data, the specific difference in response-function performance between a province where the national government retains administrative control (Ituri) and one where it does not (North Kivu); and to place that comparison in historical context using DRC's own most directly comparable precedent, the 2018–2020 Ebola outbreak, which occurred in the same two provinces under conflict conditions that, while not identical, were similarly characterised by contested access, community mistrust, and direct attacks on the response. That episode was extensively documented in the peer-reviewed literature in a way the current outbreak has not yet been, offering an empirical benchmark against which the plausibility of an access-driven explanation for the current pattern can be assessed. The analysis proceeds in four parts: a context and problem analysis; an evidence and critical analysis presenting the province-level data, the historical comparison, and a triangulated interpretation; implications for policy and practice; and a conclusion.

2. Context and problem analysis

2.1 The eastern DRC conflict landscape

Eastern DRC's conflict is not a backdrop to this outbreak; it is one of the most protracted, complex security crises in the world, predating both the current epidemic and its 2018–2020 predecessor. Decades of conflict have displaced more than five million people across Ituri, North Kivu, and South Kivu combined (13); more recent UN refugee agency figures put total national displacement at 8.2 million as of September 2025, projected to reach 9 million by end-2026, including 5.8 million internally displaced, concentrated in these eastern provinces (14). The conflict is financed partly through control of artisanal mining sites producing gold, tin, tungsten, and tantalum, and competition for these resources recurrently drives confrontation between armed groups, the state, and, since 2025, the AFC/M23 administration (9, 13). This mineral-linked population mobility directly complicates contact tracing, since exposed individuals may cross administrative and control-line boundaries between exposure and case investigation. Violence against health care is itself a persistent, independently documented feature of this landscape: in 2023 alone, over 100 armed groups were active across North Kivu, Ituri, South Kivu, and Tanganyika, and 115 incidents of violence against or obstruction of health care were recorded in DRC, including kidnappings of health workers and looting of medical supplies (15).

2.2 Territorial change since 2025 and its operational implications

The AFC/M23 coalition's capture of Goma in January 2025, and subsequent expansion into Bukavu and Uvira, fundamentally altered the operating environment for any health response in North Kivu and South Kivu (10). OCHA reporting describes this territorial expansion as causing renewed displacement, while at times forcing hundreds of thousands of previously displaced families to return to areas that remain fragile and only partially serviced (10). A December 2025 MONUSCO report, cited in UN reporting on the outbreak, documented persistent violence across Ituri and North Kivu in the months preceding the

outbreak's declaration, including attacks on villages, health facilities, and displaced communities that killed hundreds of civilians; the same reporting noted that fighting and movement restrictions were already limiting civilian movement and disrupting essential services before the first BVD case was confirmed (16). Displacement attributable to the current period is substantial in its own right: independent reporting estimated nearly one million people displaced within North Kivu specifically, with roughly 100,000 newly displaced in the first quarter of 2026 alone, immediately before the outbreak's onset (11).

2.3 A governance configuration without precedent in filovirus response

No prior Ebola or Marburg response, including the 2018–2020 DRC outbreak, has operated at scale inside territory under sustained administrative control of a non-state armed coalition maintaining a parallel civil administration. Field reporting describes AFC/M23 forces providing security for the movement's own authorities at the National Biomedical Research Institute (INRB) laboratory in Goma responsible for analysing suspected Bundibugyo virus specimens - illustrating how deeply the response's core diagnostic infrastructure is embedded within contested governance, rather than operating alongside or independently of it (9). Congolese officials have themselves raised concern that an effective national response requires disengagement of Rwandan-backed forces from health infrastructure, reflecting a political dimension to outbreak control with no equivalent in 2018–2020, when the state, whatever its operational weaknesses, retained undisputed nominal authority throughout the affected territory (11).

2.4 Why the 2018–2020 outbreak is the appropriate comparator

DRC's tenth Ebola outbreak, declared on 1 August 2018 in North Kivu and later spreading into Ituri, is the most relevant historical comparator available, for three reasons. First, it occurred in the identical two provinces now most affected by BVD. Second, it was, at the time, the most conflict-affected Ebola response ever mounted, generating an unusually rich peer-reviewed literature on the operational and epidemiological consequences of insecurity, mistrust, and direct attacks on response infrastructure - literature that does not yet exist for the current outbreak. Third, its final outcome is fully known (declared over in June 2020, with 3,481 total cases and 2,299 deaths, a case fatality of 66.0%) (17), allowing its trajectory to be compared against the current, still-evolving outbreak without the interpretive uncertainty of comparing a completed epidemic with an ongoing one on ecological grounds alone. A further, more practical reason reinforces the first three: because the 2018–2020 response generated province- and health-zone-level operational data that were subsequently analysed and published, it is possible to compare not only aggregate outcomes but the specific response-function indicators - contact-tracing completeness, time to isolation, community-reported trust - this analysis uses to characterise the current outbreak, giving the comparison a like-for-like quality a more distant historical outbreak could not offer. The remainder of this analysis uses that precedent as an explicit, descriptive benchmark against which

the plausibility of the access-driven explanation for the current Ituri-North Kivu gap can be assessed - illustratively, not as a natural experiment or control group from which a causal effect of governance status could be formally estimated.

3. Evidence and critical analysis

3.1 Data sources and analytic approach

We extracted province-level case counts, deaths, and contact-tracing coverage from WHO, ECDC, and Africa CDC situational reporting published between late July and early August 2026 (5, 6, 18). All figures used are as published in these sources; no individual-level or unpublished data were accessed. We compared Ituri and North Kivu on three metrics: cumulative case fatality (deaths/confirmed cases), the proportion of each province's health zones reporting confirmed cases, and contact-tracing follow-up coverage, the last drawn specifically from Africa CDC's province-disaggregated reporting (18). National case totals were independently cross-checked against an unaffiliated European national public health institute's aggregation of the same outbreak, which reported figures consistent with the WHO/ECDC series (19). We supplemented this current-outbreak comparison with a structured historical comparison against the 2018–2020 outbreak, drawing on the US CDC's Morbidity and Mortality Weekly Report (MMWR) account of that outbreak's final case count and trajectory (20), WHO's own closing outbreak summary (17), and the peer-reviewed literature documenting conflict-related disruption to that response (21, 22, 23). Consistent with recognised principles of ecological study design, we treat the current-outbreak comparison as hypothesis-generating rather than causally definitive (24): differences observed cannot be attributed to territorial control status alone, given that the two provinces also differ in population density, road and health infrastructure, outbreak duration to date, and baseline health-system capacity, all of which independently affect response performance.

3.2 Current outbreak: province-level results

As of 7–8 August 2026, Ituri Province had reported 3,636 confirmed cases and 1,551 deaths (case fatality 42.7%) across 28 of its 36 health zones; North Kivu had reported 470 confirmed cases and 315 deaths (case fatality 67.0%) across 12 of its 34 health zones (5). National contact-tracing follow-up reached 79.2% of the 18,276 registered contacts as of early August, but this masked substantial provincial variation: follow-up in North Kivu stood at 74.7% and in Haut-Uélé at 66.7%, both below the national figure and well below the 90–95% coverage threshold WHO technical guidance identifies as necessary to interrupt transmission (18, 25).

Table 1
Province-level surveillance indicators, Ituri and North Kivu, 2026 Bundibugyo virus disease outbreak, as of 7–8 August 2026.

Metric	Ituri Province	North Kivu Province
Confirmed cases (7–8 Aug 2026)	3,636	470
Deaths	1,551	315
Case fatality (published)	42.7%	67.0%
Health zones affected / total	28 / 36	12 / 34
Contact-tracing follow-up (early Aug 2026)	75.5%	74.7%

The case-fatality gap is striking but should not be read as a direct conflict effect without qualification. North Kivu's smaller absolute case count makes its case-fatality estimate more sensitive to reporting completeness and to a handful of severe, late-detected clusters, and the province's local transmission chain is less mature than Ituri's, which mechanically inflates case fatality in earlier phases of transmission before recoveries accumulate. The response's own workforce data illustrate the scale of the burden regardless of provincial attribution: by 15 July 2026, 119 health workers had been confirmed infected nationally, with 36 deaths, a health-worker case fatality of 30.3%, rising to at least 151 confirmed infections and 44 deaths by 30 July (26, 6).

To make these alternative explanations testable rather than qualitative caveats, we computed two-proportion z-tests with Wald-type 95% confidence intervals on the published case and death counts. North Kivu's case fatality (67.0%, 315/470) exceeds Ituri's (42.7%, 1,551/3,636) by 24.4 percentage points (95% CI 19.8–28.9; $z = 9.98$, $p < 0.001$) - a difference far too large to be a sampling artefact of North Kivu's smaller caseload, so the gap itself is statistically robust. That precision, however, answers only whether the gap is real, not what causes it: the epidemic-phase and case-ascertainment explanations above remain fully compatible with a statistically significant difference. As a direct, quantitative test of the epidemic-phase explanation, we compared each province's current case fatality against the fully resolved 2018–2020 outbreak in the same geography (66.0%, 2,299/3,481): North Kivu's current case fatality is statistically indistinguishable from that historical benchmark (67.0% vs 66.0%; 95% CI for the difference – 3.6 to 5.5 percentage points; $z = 0.42$, $p = 0.67$), whereas Ituri's is significantly lower than it (42.7% vs 66.0%; 95% CI -25.6 to -21.1 percentage points; $z = -19.8$, $p < 0.001$). This pattern is at least as consistent with a non-governance reading as with a governance-driven one: North Kivu's 2026 case fatality is not anomalously high in absolute terms - it closely matches what this same geography produced before, under a different conflict configuration - while Ituri's is unusually low relative to that same benchmark, which is equally compatible with more complete ascertainment of milder, surviving cases in the province under fuller national control. We report this comparison so that the epidemic-phase and ascertainment explanations are falsifiable and central to interpretation, rather than caveats introduced after a governance-driven reading has already been presented.

3.3 Historical comparator: the 2018–2020 outbreak in the same provinces

The tenth DRC Ebola outbreak offers a directly comparable, fully resolved precedent, summarised alongside the current outbreak in Table 2. It was repeatedly and severely disrupted by conflict-linked violence directed at the response itself. On 24 and 27 February 2019, Médecins Sans Frontières-run Ebola treatment centres in Katwa and Butembo were attacked and burned, forcing MSF to suspend activities at both sites (27). On 19 April 2019, Dr Richard Mouzoko Kiboung, a WHO epidemiologist, was shot and killed by armed men during a coordination meeting at Butembo University Hospital, and two colleagues were injured; WHO leadership stated at the time that 'cases are increasing because of violent acts that set us back each time' (28, 29). A population-based survey of 961 adults in Beni and Butembo, conducted during that outbreak, found that only 31.9% of respondents trusted that local authorities represented their interests, and that 230 of 961 respondents believed the Ebola outbreak was not real; both low institutional trust and belief in misinformation were independently associated with reduced uptake of vaccination and formal medical care (21). A separate survey of knowledge and beliefs in the same conflict-affected region reached compatible conclusions about the depth of the trust deficit responders faced (22).

Table 2

Comparison of conflict-affected outbreak indicators: DRC's tenth Ebola outbreak (2018–2020) versus the 2026 Bundibugyo virus disease outbreak, both centred on North Kivu and Ituri provinces.

Indicator	2018–2020 outbreak (North Kivu–Ituri)	2026 outbreak (as of 7–8 Aug 2026)
Total confirmed + probable cases	3,481 (3,323 confirmed, 158 probable)	4,209 confirmed (national, ongoing)
Total deaths	2,299	1,916 (national, ongoing)
Case fatality ratio	66.0% (final)	45.5% (national, provisional)
Days to 1,000 confirmed cases	~ 235 days	40 days
Duration to closure	~ 22 months (Aug 2018–Jun 2020)	Ongoing (declared 15 May 2026)
Dominant armed actors	ADF, Mai-Mai factions	ADF, CODECO, AFC/M23
Documented direct attacks on response	MSF ETC attacks (Katwa, Butembo, Feb 2019); killing of WHO epidemiologist (Apr 2019)	Territorial administration of response infrastructure by AFC/M23 in Goma

3.4 Triangulating the current pattern against the historical precedent

Three non-exclusive explanations are consistent with the current Ituri-North Kivu gap. First, a genuine access effect: humanitarian and health-system access into AFC/M23-administered territory has been repeatedly flagged as constrained in this response's own operational reporting (30), and access constraints plausibly delay both contact-tracing initiation and isolation of cases, directly worsening outcome-resolved case fatality. Second, an epidemic-phase effect: North Kivu's transmission chain is, by these same reports, more recently established and smaller than Ituri's, and early-phase case fatality is mechanically less reliable as an outcome estimator because it is calculated before the denominator of eventual survivors is complete. Third, a case-ascertainment effect: if governance disruption in North Kivu reduces the completeness of case detection specifically among milder or recovering patients, the surviving cases entering the confirmed-case denominator would be enriched for severe presentations, inflating observed case fatality independent of any true difference in care quality.

The current outbreak's ecological design, taken alone, cannot distinguish between these three explanations. This is precisely where the 2018–2020 precedent, summarised in Table 2, adds analytic value that the current outbreak's own data cannot provide in isolation. In that outbreak, the access-and-trust mechanism was not inferred ecologically; it was measured directly, through population surveys documenting the specific behavioural pathway (low trust and belief in misinformation predicting reduced care-seeking and vaccine uptake) by which conflict-driven access and trust deficits are understood to translate into worse outcomes (21, 22). The same outbreak also demonstrated, through directly observed events rather than inference, that attacks on treatment infrastructure and responders produce measurable slowdowns in response activities, in the WHO leadership's own contemporaneous account (28). Given that North Kivu is, in the current outbreak, subject to a governance disruption at least as severe as, and arguably more structurally entrenched than, the conditions documented in 2018–2020, the historical precedent makes the access-driven explanation for the current case-fatality and contact-tracing gap considerably more plausible than it would appear from the current outbreak's ecological data alone. This is triangulation across two conflict-affected epidemics in the same geography, not proof within either one, and it stands alongside, not above, the statistically equivalent epidemic-phase reading set out above: the two interpretations are not mutually exclusive, and this analysis cannot adjudicate between them.

This reading is reinforced by the current outbreak's own financing-focused literature, which found reported response-function performance below reference standards nationally and explicitly flagged insecurity and population displacement as independent limiting factors that 'cannot be attributed to financing' (12). The present analysis isolates the geographic-governance dimension of that same underlying constraint using only published, attributable secondary data, and situates it against the one historical episode in which the causal pathway from conflict to outcome was directly, rather than inferentially, documented.

3.5 Limitations

These limitations were tested directly, not merely acknowledged, in the statistical comparisons reported in Section 3.4 above; what follows are the residual constraints those tests cannot resolve. There are

limitations that qualify these conclusions. First, and most fundamentally, this is an ecological comparison of two provinces at a small number of published time points; consistent with recognised limitations of ecological analysis, it cannot control for the population-density, infrastructure, and outbreak-duration confounders named above, and it cannot establish that territorial control status, rather than a correlated factor, is the operative cause of the observed gap (24). Second, the historical comparator, while occurring in the same provinces, is not a perfect analogue: the 2018–2020 outbreak involved Zaire ebolavirus, for which a licensed vaccine became available mid-response, whereas the 2026 outbreak involves Bundibugyo virus, for which no licensed countermeasure currently exists, and the two outbreaks' conflict actors, while overlapping (ADF, CODECO), are not identical, since the AFC/M23 administration in its current, territorially consolidated form is a post-2025 development without a direct equivalent in 2018–2020. Third, published province-level figures are themselves subject to differential under-ascertainment that this analysis cannot correct for, and if that under-ascertainment is itself worse in contested territory, it would bias the comparison in ways that are difficult to sign a priori. These limitations argue for treating this analysis as hypothesis-generating, pointing toward a purpose-built, time-resolved, health-zone-level study as more granular data become available through routine situation reporting, rather than as a definitive causal estimate.

4. Implications for policy and practice

Each recommendation below is tied to a specific finding above; feasibility constraints are noted explicitly rather than assumed away, and the overall theory of change is that disaggregating response data and financing by governance status lets responders and donors distinguish an access problem from a resourcing problem in near-real time, rather than reconstructing that distinction retrospectively as this analysis has had to do.

Differentiate access-negotiation strategy from general response financing.

Motivated by the statistically robust, if not uniquely causal, North Kivu-Ituri gap documented in Section 3.4: if humanitarian access negotiation is the binding constraint in contested territory, the marginal return on additional response funding in that specific geography may be lower than in accessible provinces until access itself is secured, a distinction that generic, province-blind financing analyses cannot make but that province-disaggregated performance data, tracked and published consistently over time, can. Response plans should budget and report separately for accessible and contested geographies rather than presenting a single blended national performance figure that obscures exactly the gap this analysis identifies.

Institutionalise engagement with de facto territorial authorities as a response function, not an ad hoc exception. The current outbreak's own field reporting already shows AFC/M23 forces providing security for response infrastructure in Goma (9); the operational question is whether that engagement is systematised, documented, and subject to the same transparency and accountability standards as engagement with recognised state authorities, or left informal and undocumented. The 2018–2020

precedent suggests that responses which fail to secure a working, if uncomfortable, operational relationship with whoever exercises effective territorial control pay for that failure in attacks on treatment infrastructure and personnel, not merely in administrative friction (27, 28).

Invest in the trust-building mechanisms the 2018–2020 outbreak showed were measurably associated with better outcomes, before rather than after a trust deficit becomes apparent. The population-based evidence from Beni and Butembo specifically identified engagement with locally trusted leaders and intermediaries, rather than reliance on formal state or international authority alone, as a pathway to improved care-seeking and vaccine uptake (21, 22). For North Kivu specifically, where the current outbreak response must navigate a governance configuration the 2018–2020 response never faced, this suggests risk-communication and community-engagement resourcing should be weighted toward the contested province rather than allocated in proportion to case counts alone, since case counts in that province may themselves be suppressed by the very access and trust constraints such investment is meant to address.

Track and publish a standard, disaggregated indicator set by governance geography for the duration of the response. Contact-tracing follow-up completeness, time from symptom onset to isolation, and the proportion of deaths that are community- versus facility-notified are all indicators already collected in some form by this response (5, 18); publishing them consistently disaggregated by governance status, rather than only by administrative province, would let responders and donors distinguish an access problem from a resourcing problem in near-real time, rather than reconstructing the distinction retrospectively as this analysis has had to do.

Treat this as the second, not the first, major test of conflict-sensitive outbreak response in these specific provinces, and design accordingly. Generic conflict-sensitivity guidance exists across the humanitarian sector, but Ituri and North Kivu now have two independent, large-scale filovirus outbreaks within eight years, each occurring under active armed conflict. Standard operating procedures for future outbreaks in this specific geography should be built directly from the documented, published lessons of both episodes, rather than from generic conflict-affected-setting guidance developed for other contexts.

Fund and publish the purpose-built, health-zone-level access-versus-performance study this analysis could not itself conduct. Because this analysis relies on province-level aggregates, it cannot identify which specific access barriers - checkpoint delays, prohibited travel corridors, targeted denial of movement to responders, or simple absence of functioning health infrastructure - are driving the North Kivu gap, information that matters directly for negotiating access with territorial authorities. Donors and response coordination bodies should fund the health-zone- and time-resolved dataset needed to move from the hypothesis this analysis generates to an actionable, mechanism-specific access strategy.

5. Conclusion

The 2026 Bundibugyo virus disease outbreak is unfolding across two provinces under fundamentally different governance conditions, and the published surveillance data show a correspondingly large gap

in outcome-linked response indicators: a 24-percentage-point difference in case fatality and a contact-tracing follow-up rate in North Kivu well below the threshold needed to interrupt transmission. This ecological comparison cannot, by itself, prove that contested territorial control caused that gap. But it does not need to stand alone. DRC's own 2018–2020 Ebola outbreak, fought in the same two provinces under similarly severe, if differently structured, conflict conditions, directly documented the mechanism this analysis can only infer: attacks on treatment centres and responders that measurably slowed the response, and population-level mistrust that measurably reduced care-seeking and vaccine uptake. Read together, the two outbreaks make a stronger, though still hypothesis-generating, case than either does alone that the access and governance dimension of this crisis is a plausible and quantifiable contributor to the epidemiological response - not established by this ecological comparison, which cannot rule out epidemic-phase and case-ascertainment differences as sufficient explanations on their own, but consistent enough across two conflict-affected epidemics in the same geography to warrant confirmatory, time-matched, health-zone-level study before it is treated as settled. Response planning, financing, and preparedness for future outbreaks in eastern DRC should be built on that combined evidence base and on the confirmatory research it motivates, treating contested territory as a distinct operational category warranting its own access strategy, financing logic, and trust-building investment, rather than as a generic variant of the insecurity every outbreak response in this region has, to some degree, always had to navigate.

Declarations

Ethics approval and consent to participate

Not applicable. This analysis used only previously published, publicly available, aggregate surveillance data; no individual-level, identifiable, or unpublished data were accessed, and no new data collection involving human participants was undertaken.

Consent for publication

Not applicable.

Availability of data and materials

All data underlying this analysis are publicly available in the cited WHO, ECDC, Africa CDC, IOM, CDC, UNHCR, and UN OCHA situational reports and the cited peer-reviewed literature.

Competing interests

The authors declare no competing interests.

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References

1. World Health Organization. Ebola Bundibugyo virus disease outbreak: Democratic Republic of the Congo and Uganda. Weekly External Situation Report 01, data as of 18 May 2026. Brazzaville: WHO Regional Office for Africa. 2026. Available from: <https://www.afro.who.int/countries/democratic-republic-of-congo/publication/ebola-bundibugyo-virus-disease-outbreak-democratic-republic-congo-uganda-weekly-external-situation>. (Accessed 11 August 2026).
2. World Health Organization. Ebola virus disease. Fact sheet. Available from: <https://www.who.int/news-room/fact-sheets/detail/ebola-virus-disease>. (Accessed 11 August 2026).
3. World Health Organization. Disease Outbreak News: Ebola disease caused by Bundibugyo virus – Democratic Republic of the Congo. 21 May 2026 (public health emergency of international concern declaration). Available from: <https://www.who.int/emergencies/disease-outbreak-news/item/2026-DON603>. (Accessed 11 August 2026).
4. World Health Organization. International Health Regulations. (2005), 3rd edition. Geneva: WHO; 2016. Available from: <https://www.who.int/publications/i/item/9789241580496>. (Accessed 11 August 2026).
5. European Centre for Disease Prevention and Control. Ebola outbreak in the Democratic Republic of the Congo and Uganda. Updated 8 August 2026. Available from: <https://www.ecdc.europa.eu/en/ebola-outbreak-democratic-republic-congo-and-uganda>. (Accessed 11 August 2026).
6. World Health Organization. Disease Outbreak News: Ebola disease caused by Bundibugyo virus – Democratic Republic of the Congo. 30 July 2026. Available from: <https://www.who.int/emergencies/disease-outbreak-news/item/2026-DON614>. (Accessed 11 August 2026).
7. Sullivan NJ. Bundibugyo Virus Disease in 2026 – Clinical and Public Health Responses. *N Engl J Med*. 2026;395(3):278–89. 10.1056/NEJMra2607216.
8. Centers for Disease Control and Prevention. Ebola Outbreak: Current Situation. Updated August 2026. Available from: <https://www.cdc.gov/ebola/situation-summary/index.html>. (Accessed 11 August 2026).

9. Doctors Without Borders/Médecins Sans Frontières. Bundibugyo virus: Why this Ebola disease outbreak is different. 2026. Available from: <https://www.doctorswithoutborders.org/latest/bundibugyo-virus-why-ebola-disease-outbreak-different>. (Accessed 11 August 2026).
10. UN Office for the Coordination of Humanitarian Affairs. Democratic Republic of the Congo. Available from: <https://www.unocha.org/democratic-republic-congo>. (Accessed 11 August 2026).
11. The New Humanitarian. As Ebola resurfaces in DR Congo, so do critical questions about how to respond. 22. May 2026. Available from: <https://www.thenewhumanitarian.org/news-feature/2026/05/22/ebola-resurfaces-dr-congo-response>. (Accessed 11 August 2026).
12. Bhadelia N. Bundibugyo virus outbreak: when a concerning pathogen meets a humanitarian emergency. *Nat Rev Microbiol*. 2026;24:515–6. 10.1038/s41579-026-01332-9.
13. Africa Center for Strategic Studies. Ebola Epidemic in the DRC: Explainer. 2026. Available from: <https://africacenter.org/spotlight/ebola-drc/>. (Accessed 11 August 2026).
14. UNHCR. DR Congo emergency. Operational update. Available from: <https://www.unhcr.org/emergencies/dr-congo-emergency>. (Accessed 11 August 2026).
15. Insecurity Insight / Safeguarding Health in Conflict Coalition. Democratic Republic of the Congo: Violence Against Health Care in Conflict 2023. ReliefWeb. Available from: <https://reliefweb.int/report/democratic-republic-congo/democratic-republic-congo-violence-against-health-care-conflict-2023>. (Accessed 11 August 2026).
16. UN News. Ebola outbreak in DR Congo collides with conflict and hunger, WHO warns., 30 May 2026. Available from: <https://news.un.org/en/story/2026/05/1167592>. (Accessed 11 August 2026).
17. World Health Organization. Ebola outbreak 2018–2020, North Kivu–Ituri, Democratic Republic of the Congo – situation summary. Available from: <https://www.who.int/emergencies/situations/Ebola-2019-drc->. (Accessed 11 August 2026).
18. Africa CDC, August. Bundibugyo Virus Disease Outbreak Situational Report., 2 2026. Africa Health Knowledge Hub. Available from: <https://khub.africacdc.org/records/resource/bundibugyo-virus-disease-outbreak-situational-report-august-2-2026>. (Accessed 11 August 2026).
19. National Institute for Public Health and the Environment (RIVM). Netherlands. Current information about Ebola. Available from: <https://www.rivm.nl/en/ebola/current-information>. (Accessed 11 August 2026).
20. Aruna A, Mbala P, Minikulu L, et al. Ebola Virus Disease Outbreak – Democratic Republic of the Congo, August 2018–November 2019. *MMWR Morb Mortal Wkly Rep*. 2019;68(50):1162–5. 10.15585/mmwr.mm6850a3.
21. Vinck P, Pham PN, Bindu KK, Bedford J, Nilles EJ. Institutional trust and misinformation in the response to the 2018–19 Ebola outbreak in North Kivu, DR Congo: a population-based survey. *Lancet Infect Dis*. 2019;19(5):529–36. 10.1016/S1473-3099(19)30063-5.
22. Oppenheim B, Lidow N, Ayscue P, Saylor K, Mbala P, Kumakamba C, Kleinman M. Knowledge and beliefs about Ebola virus in a conflict-affected area: early evidence from the North Kivu outbreak. *J*

- Glob Health. 2019;9(2):020311. 10.7189/jogh.09.020311.
23. Aylward B, et al. The Ongoing Ebola Epidemic in the Democratic Republic of Congo, 2018–2019. *N Engl J Med*. 2019;381:373–83. 10.1056/NEJMSr1904253.
 24. Morgenstern H. Uses of ecologic analysis in epidemiologic research. *Am J Public Health*. 1982;72(12):1336–44. 10.2105/AJPH.72.12.1336.
 25. ; World Health Organization. Contact Tracing During an Outbreak of Ebola Virus Disease. Geneva: WHO, September. 2014. Available from: <https://iris.who.int/server/api/core/bitstreams/b67997f1-51d2-43ad-a6cf-d9169f2260d1/content>. (Accessed 12 August 2026).
 26. World Health Organization. Disease Outbreak News: Ebola disease caused by Bundibugyo virus – Democratic Republic of the Congo and Uganda. 15 July 2026. Available from: <https://www.who.int/emergencies/disease-outbreak-news/item/2026-DON613>. (Accessed 12 August 2026).
 27. World Health Organization Regional Office for Africa. Statements and commentaries archive – WHO deeply concerned about attacks on MSF-run Ebola treatment centres, 28 February 2019. Available from: <https://www.afro.who.int/media-centre/statements-commentaries>. (Accessed 12 August 2026).
 28. World Health Organization Regional Office for Africa. Statement from WHO High-Level Mission to Butembo, DRC: Ebola situation worsening while support lags. 01 May 2019. Available from: <https://www.afro.who.int/media-centre/statements-commentaries/statement-who-high-level-mission-butembo-drc-ebola-situation>. (Accessed 12 August 2026).
 29. World Health Organization. WHO Ebola responder killed in attack on the Butembo hospital. 19. April 2019. Available from: <https://www.who.int/news/item/19-04-2019-who-ebola-responder-killed-in-attack-on-the-butembo-hospital>. (Accessed 12 August 2026).
 30. International Organization for Migration. Multi-Country Bundibugyo Ebola Virus Disease Outbreak Situation Report No. 12 (27 July–2. August 2026). ReliefWeb. Available from: <https://reliefweb.int/report/democratic-republic-congo/iom-multi-country-bundibugyo-ebola-virus-disease-outbreak-situation-report-no-12-27-july-2-august-2026>. (Accessed 13 August 2026).

Figures

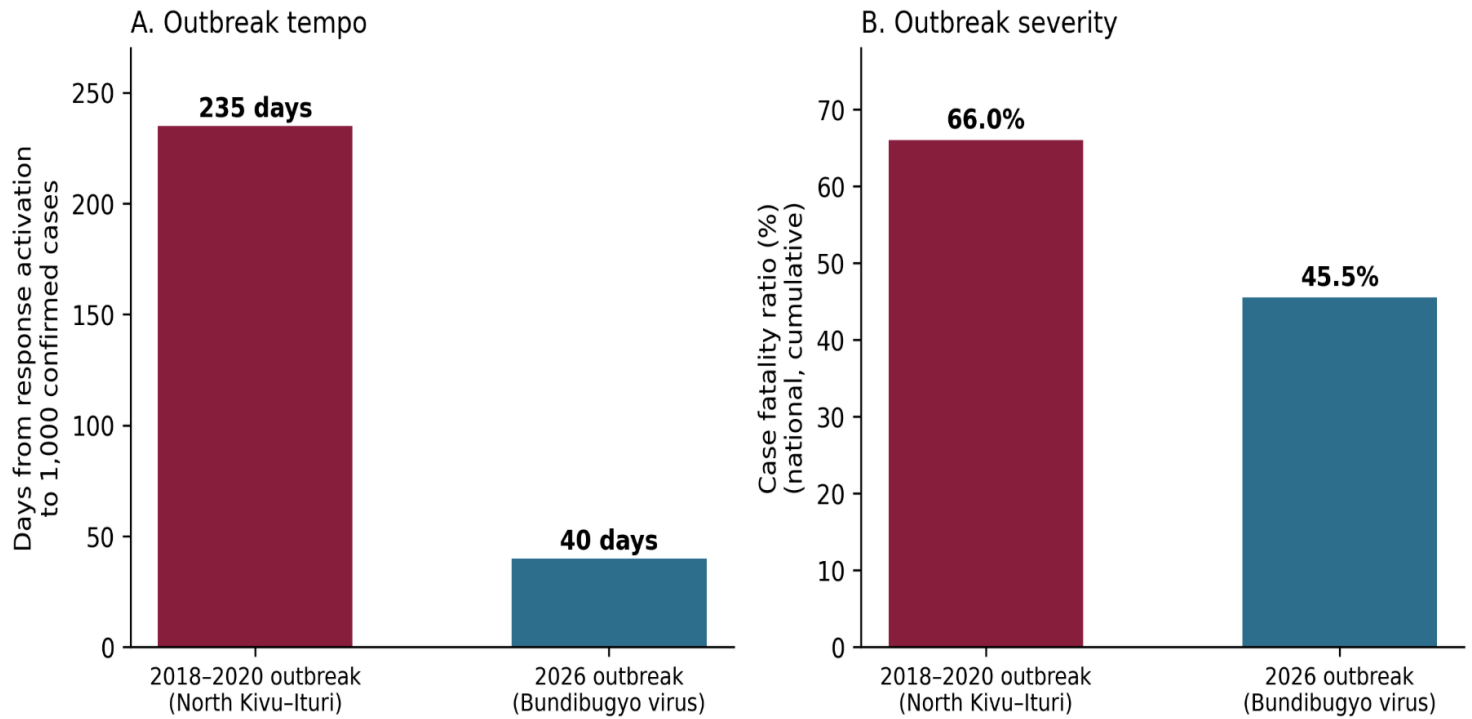


Figure 1

Outbreak tempo (panel A) and severity (panel B) compared between DRC's 2018-2020 Ebola outbreak and the 2026 Bundibugyo virus disease outbreak. Panel A shows days from response activation to 1,000 confirmed cases; Panel B shows the cumulative national case fatality ratio (final for 2018–2020; provisional, as of 7–8 August 2026, for the current outbreak).