



Did COVID-19 vaccine enforcement work? Evidence from northwestern and northern Uganda

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ABSTRACT

During the COVID-19 pandemic, vaccination programmes were shaped by diverse approaches to enforcement. Yet, little is known about how public authority influenced modes of enforcement on the ground or their ramifications for governance and public health more broadly. This article focuses on the Ugandan mandatory COVID-19 vaccination programme in two contrasting geographical and socio-political spaces: rural Dei and peri-urban Gulu. Ethnographic and survey research demonstrated that enforcement occurred in different ways and by diverse public authorities, with ostensibly contrasting results. In Dei, self-reported vaccine uptake and coverage was 77 % and 73 % respectively; while in Gulu, it was 46 % and 23 %, and below the national target of 70 %.

Public authority dynamics explain these differences. In Dei, the military co-opted official political figures and side-lined other local leaders. Anxieties about the vaccine were dismissed, and people were forcibly vaccinated against a disease which they did not perceive to be a significant problem. In Gulu, the military were barely involved. Instead, government appointees and civil servants made efforts to alleviate anxieties through news media, whilst also requiring proof of vaccination to access, or remain employed at, schools, universities, health care facilities. However, some officials undermined the strategy, including health care workers who provided false vaccination certificates.

Despite the apparent success of high vaccine uptake reported in Dei, available data suggests that it is unlikely that efforts to enforce vaccination at either field site shaped the course of the COVID-19 outbreaks. Instrumentally violent enforcement 'works' if resistance is not possible, as it was in Dei, but may be counterproductive. Enforcement procedures at both sites provided opportunities to entrench unaccountable modes of governance and fostered mistrust of the government's intentions, thereby weakening previously established vaccine compliance procedures. A public authority lens thus foregrounds the importance of moving beyond narrow public health metrics and engaging with broader conceptions of whether enforced vaccination is effective, and if so, for whom and what purpose.

1. Introduction

The COVID-19 pandemic reignited long standing debates about whether or not there are circumstances in which it is appropriate to pressurise or force citizens to be vaccinated. Across the globe, public health practitioners and academics discussed the legal, moral, ethical, political and public health dimensions. Opinion pieces outlining the advantages and disadvantages of different policies were commonplace

(e.g., Gostin et al., 2021; King et al., 2022), with Bardosh et al. (2022), in a much-cited review, detailing the variety of policies implemented. These included 'no jab, no job' mandates, school-based and health care mandates, in-country passports to enter public spaces (such as restaurants) as well as mandates focusing on the elderly and, in some cases, the whole country. The authors also highlighted an important point: there is limited research documenting what happened in practice. This is particularly the case in low-income, resource constrained countries

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where it is increasingly common for armed forces to be involved in the delivery of healthcare during health emergencies (Parker et al., 2022). Crucial questions remain unanswered in these places. How did socio-political dynamics and histories influence the way in which mandatory COVID-19 vaccination occurred within a country? Under what circumstances did a requirement to have a vaccine become enforced violently? How, and why, was it possible to resist enforcement in some circumstances, but not in others? Did enforcement by soldiers and other actors work? If so, in what ways and for whom?

This article addresses these questions with reference to Uganda – a country which has been lauded by international donors and the medical establishment for the speed and effectiveness with which it responded to the COVID-19 pandemic (The Lancet COVID-19 Commissioners (2020)). It uses a public authority lens, with public authority defined as ‘any kind of authority beyond the immediate family that commands a degree of consent’ (CPAID, 2018). Such a lens captures the multiple (and often hidden) processes shaping the way governance and collective action happens on the ground, including those occurring outside of formal arrangements (Kirk and Allen, 2021). In the domain of public health, it has been used to show why, and how, ostensibly similar epidemic control measures (such as the promotion of safe and dignified burials, homebased care and quarantine) were often perceived and implemented in diverse and unanticipated ways in Sierra Leone (Parker et al., 2019a; Parker et al., 2019b). It has also been used to analyse responses to COVID-19 lockdown policies in populations inhabiting the borderlands of Uganda, DRC and South Sudan (Parker et al., 2022; Kirk et al., 2021; Allen and Parker, 2023), but it has not been used previously to analyse vaccination, let alone variations in vaccine coverage within a country rolling out mandatory COVID-19 vaccinations in the context of a declared health emergency.

The article begins with an overview of relevant literature on vaccination programmes and the Ugandan context, followed by a discussion of the field sites and methods. Two case studies, based on long term ethnographic fieldwork, follow. The first details how and why it was possible to enforce vaccination in rural Dei, northwestern Uganda, even when the majority of people did not perceive COVID-19 to be a problem and did not want to be vaccinated. The second case study details how, and why, it was possible for most people to evade vaccination in peri-urban Gulu, northern Uganda – at a time when deaths associated with COVID-19 were known to be occurring in the city, and elsewhere. Together, these case studies demonstrate how public authorities influenced the roll out of the national COVID-19 vaccination programme in different ways in two contrasting geographical spaces, with considerable impacts on vaccine uptake (the proportion of people who received one or more COVID-19 vaccines) and coverage (the proportion of people who received the required number of doses). Overall, it is argued that vaccine enforcement from a public health perspective was, at best, ineffective and, at worst, counterproductive. From a political perspective, it enabled the entrenchment of unaccountable modes of governance whilst furthering distrust in government. A public authority lens therefore highlights the necessity of a wider framing of whether vaccine enforcement ‘works’. It highlights who benefits and for what purpose; and foregrounds the acute challenges of achieving viable and sustainable public health with current enforcement strategies.

2. Socio-political dimensions of vaccination programmes in low income, resource constrained settings

Research has long foregrounded socio-political aspects of vaccination programmes seeking to control or eradicate infectious diseases, including in low income, resource constrained settings. This is evident, for example, in work on smallpox (Greenough, 1995; White, 2000), polio (Yahya, 2007; Renne, 2010, 2017; Closser, 2010), neonatal tetanus (Feldman-Savelsberg et al., 2017), and combined vaccines such as DTP (Leach and Fairhead, 2007). A recurring theme has been recognition that widespread fear, anxiety, reluctance and, at times, collective

resistance to routine or childhood vaccination may occur, particularly among socio-politically marginalised groups. Explanations vary, with Closser et al. (2016) noting that scholars often emphasise how locally specific sociopolitical issues shape the success or otherwise of vaccination programmes. Nevertheless, several inter-related challenges commonly arise across countries and contexts. These include the legacies of colonial governance, fraught state-citizen relations, religion, and complex relationships between (often globally funded) vaccination programmes and other less well funded kinds of health care.

An additional issue addressed in some of the above work, which is becoming an increasing focus of interest, is civil-military collaborations, especially during public health emergencies (e.g., Levine and Manderson, 2020; Gibson-Fall, 2021; Parker et al., 2022; McInnes, 2024). However, research specifically on the roles of the military in vaccination programmes is limited. Renne (2017) and Closser (2010) have both analysed how, and why, deploying armed forces to roll out polio vaccinations entrenched distrust in governments and international donors in Nigeria and Pakistan respectively. Armed forces were also deployed to enforce vaccination during the 2009 Avian flu epidemic in Malawi (Sambala and Manderson, 2018) and, more recently, government security forces and armed groups worked closely with the WHO to contain Ebola with ring vaccinations in eastern DRC in 2018. Analysing these events, the Congo Research Group (2021) suggested that militarised responses in an area of protracted armed conflict contributed to vicious cycles of resistance and violence, while their impact on the course of the epidemic remains open to question. Taken together, this work suggests that, at best, vaccines are delivered but fear is amplified, and distrust entrenched. At worst, coverage is low and conflict is sustained.

Echoing many of the points made in the literature above, researchers working on the COVID-19 pandemic were quick to point out that anxieties and mistrust were likely to hamper endeavours to contain the virus through mass vaccination of adults (e.g., Larson, 2020; Ali et al., 2021; Kasstan, 2021). Indeed, they called for a move away from narrow and standardised approaches to risk communication and community engagement to broader approaches acknowledging how wider historical, political and economic forces were re-enforcing inequalities and amplifying mistrust (e.g., Gamlin et al., 2021; MacGregor and Leach, 2022; Enria et al., 2021). Arguably, these publications imply that enforced vaccination by soldiers and others would amplify the concerns highlighted. However, the topic is not addressed directly. This article helps to fill that gap.

2.1. Uganda’s mandatory COVID-19 vaccination programme in political context

Deployment of instrumental force in the name of public health has a history in Uganda. During the Protectorate, large numbers of people were forcibly moved in an endeavour to contain the spread of trypanosomiasis (Vaughan, 1991); and behavioural changes were sometimes violently enforced to contain HIV/AIDS in the 1980s (Allen, 2006). The current president, Yoweri Museveni, came to power in 1986. He has remained in office by adopting strategies that hollow out democratic processes and strengthen authoritarian rule, including the manipulation of elections (Fisher and Anderson, 2015; Tapscott, 2021; Abrahamsen and Bareebe, 2021). At various points in his tenure, Museveni has turned to the Ugandan army (officially termed the Ugandan People’s Defence Force [UPDF] since 1995) to help contain outbreaks of infectious disease – including Marburg, Ebola, and COVID-19 in 2020–2022. The latter involved imposing two militarised nationwide lockdowns. These took place from March 20th to June 2nd 2020 and June 6th to July 31st 2021, with multiple restrictions (including curfews, bans on political rallies and the closure of schools) occurring for long stretches of time (Parker et al., 2022). Human rights abuses were widely reported (e.g. Nkuubi, 2020).

Initially, soldiers were not used to roll out the vaccination programme. Instead, when a limited number of vaccines first arrived in the

country in March 2021, the government directed front line health workers, soldiers, teachers and ‘the elderly’ (defined as 50 years or more) to receive them. At the time, there was widespread fear and anxiety about taking a newly developed vaccine; and this was extensively reported in national news and social media. Nevertheless, the Delta wave from May–August 2021 created demand, especially among eligible groups living in urban areas (Leach et al., 2022).

By September 2021, vaccines were widely available, but the Delta wave had passed, and demand dissipated. Amidst concern that coverage would be low, and millions of doses of vaccines would expire, the government announced that all citizens over the age of 18 would be required to take the vaccine, whether they wanted to have it or not (Museveni, 2021). The army were mobilised to enforce the policy. They were instructed to prevent travel without proof of vaccination. Health workers were also told to prevent people receiving health care without a vaccination certificate. To help enforce these measures, President Museveni subsequently declared that senior government officials – notably Resident District Commissioners (RDC), Chief Administrative Officers (CAO) and the District Medical Officers (DMO) – would be sacked if there were any indications that vaccines which had been allocated to their districts had not been used.

While there was much discussion in Ugandan media about the merits or otherwise of such a policy (e.g., Mwanje, 2022; Naikoba, 2022), there has been little research detailing what happened in practice. Instead, research has focused on anticipated or actual COVID-19 vaccine coverage among epidemiologically defined risk groups such as such as frontline health care workers (Kyakuwa et al., 2022; Kyakuwa et al., 2024; Ouni et al., 2023), medical students (Kanyike et al., 2021) and people attending out-patient clinics for diabetes, HIV/AIDS and/or cardiovascular disease (Bongomin et al., 2021). Age (Ndejo et al., 2023) and regional variations in coverage have also been discussed (King et al., 2023). In all cases, research was based on cross-sectional surveys. It relied on telephone or face-to-face interviews, and foregrounded variations in both knowledge and acceptability of COVID-19 vaccinations. Findings were presented in an ahistorical and apolitical way and tended to reify socio-cultural issues to explain coverage levels. The role of the military and other influential public authorities was not discussed.

Taking a different approach, Storer and Anguyo’s blog (2023) highlights official data indicating low vaccination uptake among health workers in Arua city, northwestern Uganda. The authors attribute this to widespread distrust in government and medical authorities, which is considered to be emblematic of wider national and international inequalities. Meanwhile, Leach et al. (2022) presented comparative ethnographic findings from field sites in Uganda and Sierra Leone; and Mylan (2024) presented findings from long term ethnographic fieldwork in a refugee camp, northern Uganda. Both articles usefully call for a reworked conceptualisation of vaccine preparedness. In common with Storer and Anguyo, they do not discuss the merits, or otherwise, of vaccine enforcement, but their work implies that enforcement would be problematic. Taking a similar ethnographic approach, this article focuses directly on the role of diverse public authorities in shaping the COVID-19 vaccine enforcement programme at two contrasting sites in Uganda.

3. Field sites and methods

Ethnographic fieldwork took place between March 2021 and December 2023 in two purposively selected contrasting areas: Dei sub-county, a rural part of Pakwach district, northwestern Uganda and Pece-Laroo division, a predominantly peri-urban area located a few kilometres from Gulu city, northern Uganda. Research focused on 12 selected villages split evenly between these two contrasting areas. As indicated further on, these villages were purposively selected to capture the range of geographical localities in each area.

Initially, open-ended, unstructured interviews were carried out in both areas with figures of public authority. This included: local council

chairpersons, security officers, health assistants, religious figureheads, village health team members, teachers, and spokespersons for fisherfolk. Issues emerging from these interviews included: fears and anxieties about the COVID-19 vaccines; the role of formal and informal figures of public authority in shaping perceptions of the vaccines; the emergence of diverse strategies to evade vaccination; and enforcement by the armed forces. To explore the way in which these issues influenced uptake and coverage of COVID-19 vaccinations within and between field sites, a semi-structured questionnaire was designed. It focused on recording the number, type and timing of COVID-19 vaccines received among a 20 % random sample of people living in study villages. Building on demographic data provided by local council chairpersons, a sample was derived by starting at the outside of a study village, and then walking in a straight line from one end of the village to the other. Every third household was selected along the imagined line, with one adult being interviewed from each household. Members of the research team then walked half-way round to the point where they had started from, and created a new imaginary line, whereby they interviewed one person from every third household selected. After completing the surveys, follow-up unstructured interviews were carried out with figures of public authority to explore additional issues that emerged from this work. In Pece-Laroo division, Gulu, for example, additional health workers were interviewed to further understanding of the rationale for selling vaccine certificates.

In Dei sub-county, a total of 40 open-ended unstructured interviews were carried out, and a further 200 semi-structured interviews with adults residing in the selected villages (with the number of interviews in each village in brackets): Dei (73), Dei C (49), Dei Hoima (15), Orlando (18), Kayonga (17) and Athwogo (28). The first three villages lie close to DRC border, Orlando borders Nebbi district, while Kayonga is located on the shores of Lake Albert, and Athwogo is located in the hills. In Pece-Laroo division, 30 unstructured interviews and 439 semi-structured interviews were carried out with adults residing in: Aywee (80), Baromal (45), Cubu (47), Layibi central (72), Rom (143) and Vanguard (52). These villages are spread out across Gulu municipality, with some located along or close to the road leading to central Gulu, while others are located in places mainly accessed by footpaths and motorcycle tracks.

Unstructured and semi-structured interviews were either carried out in Alur (which is spoken in Dei sub-county), Acholi (which is spoken in Gulu) or English (which is widely spoken in both places). Where possible and appropriate, these interviews were recorded and transcribed in the relevant language. Interviews occurring in Alur or Acholi were then translated into English. Quantifiable data on vaccine uptake and coverage (including the presence or absence of COVID-19 vaccination certificates) were subsequently recorded on an EXCEL spreadsheet and summary statistics generated. Ethnographic fieldnotes and interview transcripts were shared by email (usually weekly) and discussed by members of the research team during bi-weekly zoom calls and five in-person workshops. Written feedback was also provided. This way of working facilitated an iterative engagement with public authority dynamics shaping the COVID-19 vaccination programme. Similarities and differences between the study areas emerged over time and these have been foregrounded in the analysis of data. Fieldwork built on long term ethnographic research carried out by research team members on epidemic preparedness and response (Akello and Parker, 2021; Leach et al., 2022; MacGregor and Leach, 2022; Parker et al., 2020, 2022). In Dei sub-county, this was preceded by research focused on the control of schistosomiasis and soil-transmitted helminths (e.g. Parker et al., 2008, 2012; Parker and Allen, 2011) and in Gulu on the return of children abducted by the Lord’s Resistance Army (e.g. Akello, 2019; Akello et al., 2010; Allen et al., 2020, 2022; Parker et al., 2021). Specific fieldwork on the COVID-19 vaccination programme was carried out by PK, BEO, BO, MP and TA in Dei, and BO, MP and GA in Gulu. PK and BO worked full time in the field, while BEO, MP, TA and GA made shorter but regular fieldwork trips. The next section presents case studies from each

research site.

4. Vaccine enforcement in practice

4.1. Case study from rural Dei, north-western Uganda

Dei sub-county lies on the northern shores of Lake Albert on the Ugandan side of the Uganda/DRC border. It has an estimated population of 22,000. Livelihoods mainly depend on small scale fishing and subsistence agriculture. The majority of residents are Lwo-speaking Alur, and they have strong social and economic connections with Alur living across the border in DRC. In many ways, their daily relations across the border are stronger than their connections with neighbouring populations in Uganda (Parker et al., 2012).

Dei's geographical location contributes to an enduring perception among the population that they are marginal to the priorities of the Kampala-based government. The fact that people are Lwo-speaking contributes to their sense of being excluded by the predominantly Bantu-speaking people of southern Uganda. It is re-enforced by the fact that the Acholi people in central northern Uganda, many of whom were involved in insurgencies against the government from 1986 to 2006, speak a closely related Lwo language. The conflict did not spread to this part of the country although displaced people did move into the area (Parker et al., 2008). During this period, soldiers were rarely seen in Dei. Indeed, until the COVID-19 pandemic, endeavours to monitor movement were limited to a single border post. Here, a couple of immigration officials occasionally expressed interest in those crossing to/from DRC, and no man's land was regularly used as a football pitch and a place to dry fish before packing it up for sale in near-by markets.

Much changed in March 2020. A highly militarised lockdown occurred across the country, with soldiers stationed at international borders. In Dei, soldiers worked closely with immigration officials, the police and locally recruited militia to enforce regulations accompanying and following the lockdown as well as a further lockdown imposed in June 2021 (Parker et al., 2022). To accommodate the influx of soldiers, a barracks was built close to the international border and the soldiers gradually extended their influence in the area. By December 2021, they were working closely with members of the Fisheries Protection Unit (FPU) to enforce legislation requiring fishermen to use larger boats and nets. Any fisherfolk caught with boats less than 8 m long and overly small nets were fined, and their equipment destroyed. By March 2022, more than 300 boats had allegedly been burnt. Such activities caused considerable anger and resentment, and re-enforced concerns that fisherfolk were being persecuted by the Ugandan state. The COVID-19 vaccination programme occurred against this backdrop.

4.1.1. COVID-19 vaccination uptake

A remarkable 95 % of the adult population were officially documented as having had one or more COVID-19 vaccines (personal communication with Dei health centre professional, March 2022). By contrast, findings from the village surveys indicated that from the 200 adults interviewed, 153 (77 %) received one or more vaccines, of whom 86 received the single-dose Johnson and Johnson vaccine. Officially reported uptake levels were predictably higher than those reported from the surveys because Congolese citizens were routinely vaccinated at the busy international border post as a condition of entry into Uganda. Irrespective of the discrepancy, the village surveys indicated that uptake levels were high and exceeded the national target of 70 %.

4.1.2. Perceptions of COVID-19 vaccines

At first, there was widespread fear and anxiety about the COVID-19 vaccines. This was sometimes articulated in general terms. For example, "this vaccine is bad; [it] makes people weak"; and "free things can always kill". There was also much discussion about the potential for vaccines to cause blood clots or impair fertility; and concerns were expressed that the vaccines would hasten death, particularly among

those affected by HIV, diabetes or asthma.

These fears were compounded by widespread, albeit misleading, reporting that some of the vaccines had expired; as well as concerns about the variety of vaccines being rolled out. To quote a 35-year-old woman: "Why are they changing the vaccines all the time? Today, you see Moderna, tomorrow, AstraZeneca, and the next day Johnson and Johnson". A Congolese resident commented: "the most feared vaccines were the Pfizer's and AstraZeneca's [because] they were immaturely made and contained some bad chemicals".

The situation was not helped by the fact that there were few officially reported cases of COVID-19 in the district and no deaths. Although several COVID-related deaths had been reported in neighbouring districts, COVID-19 was spoken about by resident fisherfolk and farmers as a disease which targeted rich people in urban environments. The following kind of comments were common: "if I may ask you, who among the poor people in Uganda did you see die?"; "we don't have COVID here in Dei ... the virus only knows tarmacked road, it doesn't know marram road." Such thoughts raised further questions about why so much emphasis was being given to vaccination when COVID-19 did not present a health problem. Noting that past vaccination programmes had been voluntary, residents suggested that "COVID-19 vaccines had a hidden agenda", and "deploying soldiers was a bad sign ... why force me on issues pertaining to my dear life?"

4.1.3. Militarising the vaccination programme

Against this background, it is unsurprising that there was widespread reluctance to receive a vaccine. To counter this, the army were mobilised. They worked closely with staff employed at the health centre as well as local figures of public authority responsible for security – notably the police, marines, FPU and Internal Security Officers (comprising the Gombolola Internal Security Officer (GISO) and the Parish Internal Security Officer (PISO)). The local councillor for the sub-county (LC3) was also involved. Two approaches dominated. First, vaccine posts were established in central places – initially at the health clinic, and subsequently at the entrance to the market, the international border crossing, and outside places of worship. Second, a 'move and comb' strategy was deployed. Here, members of the village health team (VHT) moved door to door to mobilise villagers to come forward for a vaccination. In some villages, the local council chairperson (LC1) assisted, and in other places, armed soldiers accompanied VHT members. For those people living in the hills, an effort was made to take the vaccines to these more distant places. However, in general, VHTs and LC1's operating at a distance from the centre had no voice and were sidelined or in some cases, co-opted with promises of remuneration. Attention focused on the most populated and busiest parts of the sub-county, and UPDF soldiers played an active and dominant role. Religious leaders were threatened with the closure of mosques and churches unless they acquiesced, and those people caught attempting to decline vaccination were often met with threats and violence. To quote:

"Corona vaccination was a do or die exercise" (Fisherman).

"The police and the army were beating and injecting people by force ... there was a feeling they had come to kill us!" (Pastor)

"If you hesitate, they [soldiers] show their gun ... You have to do what they want, even if [you think] the vaccine is going to kill you" (Congolese resident).

4.1.4. Challenges of evading COVID-19 vaccination

A variety of strategies were devised to evade vaccination, including hiding away in homesteads. In those instances where movement was deemed essential, people borrowed a vaccination certificate from a relative or friend, or they instructed a child to carry out a task (such as buying food from the market) on their behalf. Official border points were avoided, and new forms of movement created, including passing through ungazetted border points. Other strategies involved providing

small payments or drinks to security officials to enable movement without a certificate. In the words of one young man: “these soldiers are weak, we bought them beers.” Young women sometimes took a different approach. They described how they feigned ‘falling in love’ with UPDF soldiers to escape vaccination. To quote: “it was very easy to dodge the vaccination ... what I did was fall in love with a UPDF officer. He supported me until the exercise was done. It is better to give my body than [allow] some chemicals to enter my body whose origin I don’t know. I am always very careful in matters of life”.

However, most men and women were unable to evade the vaccine for months on end. The reason was simple: movement is central to survival. It proved impossible to collect water, fish, or access markets and health care without proof of vaccination. The following quotes from two young women illustrate this point: “... because of the business I do [buying and selling fish in markets], and the pressure that those who will not vaccinate will not move, I took the vaccine”; and “I took my baby for immunization against polio but I wasn’t served [until I agreed to have the COVID-19 vaccine]”.

Dodging the vaccinators proved particularly difficult for Congolese residents and fisherfolk – two groups that have historically been marginalised in this part of Uganda (Parker et al., 2012). An elderly Congolese resident reflected on this when he said: “we were chased like dogs ... I felt coldness in my heart. I have lived in Dei for 30 years. Everything I own is here. Their threats created fear in me ... that is why I decided to take my family members to be vaccinated”.

Fisherfolk felt similarly, with a 41-year old man saying: “That day, I took a nap under my verandah after a long night of fishing. I had barely slept for an hour when soldiers stormed the village and dragged me to a vaccination centre. I tried to resist but I was slapped for questioning why I was being forced to get a COVID jab.”

4.1.5. Variations in vaccine uptake

Although the majority of adults reported receiving one or more vaccines (77 %), vaccine uptake also varied within the sub-county. High uptake rates were reported in the villages of Dei (97 %), Orlando (83 %), Dei Hoima (73 %) and Dei C (67 %), and lower uptake rates in the villages of Kayonga (53 %) and Athwogo (50 %). Locally specific socio-political dynamics and geographical location explain these differences. To elaborate: the vaccine programme was overtly politicised and militarised from the outset. While there was scepticism among official figures of public authority about requiring all adults to have a COVID-19 vaccine, it would have been very difficult for any of them to have resisted – including those holding positions such as the GISO and PISO – because they had all been appointed or elected with a mandate to represent President Museveni’s National Resistance Movement (NRM) party. Countering the programme would have been perceived as ‘anti-government’. Acknowledging the intense pressures, a businessman said: “if you challenge them [NRM], they can follow you in political office and you end up losing your job. Yeah, it may not be now, but you will become a permanent enemy”. Similarly, a female fish seller recounted how the UPDF overtly politicised the programme by telling people: “We are here to see that the groups that usually sabotage government programmes are hunted, picked and vaccinated. Those who fail to get the vaccine are sabotaging the government”.

Having elicited support from locally elected or appointed figures, the armed forces focused attention on the most populated and strategically important parts of the sub-county – notably the international border crossing and the central market, which are located within a kilometre of each other. The administrative sub-county headquarters and the health centre are also located near-by. It was thus relatively straightforward for the UPDF to co-ordinate their activities with other official figures of public authority, including immigration officers, health officials and the sub-county chairperson (LC3). Indeed, strong working relationships had already been established with them during the two lockdowns. Additionally, unofficial leaders (such as a Congolese mobiliser) stepped in line to support the programme. Such support explains the exceptionally

high coverage reported in Dei village.

High uptake rates were also reported in Orlando, Dei C, Dei Hoima. A large number of Congolese people live in Orlando and they listened to the GISO, primarily because they shared close kin relations. The latter two villages are located close to Dei village and the shores of Lake Albert. Here, the UPDF worked closely with influential fisherfolk, who, in turn, ensured that no-one accessed boats, without proof of vaccination. One fisherman, for example, stated: “... without a vaccination card, we were not allowed to get in a boat and go fishing”. Boastfully thumping his chest, he said “we, the leadership of the fishermen, ensured that they complied”. Interestingly, they were more influential than the local councillors in persuading people to receive a vaccine, with the local councillor for Dei C openly stating that “the fishermen don’t listen to us”.

Athwogo and Kayonga had the lowest uptake rates, partly because both villages are located a considerable distance from the centre of Dei, but also because the UPDF did not have strong working relationships with official figures of public authority in these two places. None of the local councillors (LC1’s) were involved in the vaccine programme, and VHTs were minimally involved. Instead, they spoke about the way in which UPDF soldiers “harassed and tortured” their friends and relatives, and they disliked the fact that they insisted on vaccinating some of them multiple times, simply because they had mislaid their vaccination certificate. They were also unimpressed by the willingness of UPDF soldiers to accept money in exchange for dodging a vaccination.

4.1.6. Variations in vaccine coverage

Although self-reported vaccine coverage was high overall (73 %), four of the six study villages did not reach the national target of 70 %. In descending order, coverage levels (calculated by combining those who either received the single-dose Johnson and Johnson vaccine with those who received two or more other vaccines) were as follows: Dei (97 %) Dei Hoima (73 %), Orlando (67 %), Dei C (57 %), Kayonga (53 %), Athwogo (46 %). The slight reduction in coverage rates reflects the fact that the UPDF were not directed to implement any specific vaccine protocols. Therefore, citizens who had not had the single-dose Johnson and Johnson vaccine were not required to have additional doses of the other vaccines. It also reflects the fact that most people did not voluntarily choose to have a second vaccine if the first vaccine had been taken under duress. The following comments by a farmer and teacher respectively convey enduring fears and concerns: “I vowed never to get the second dose because I believe the vaccine is bad;” and “my neighbour was trapped on her way to the market and dragged to have it forcefully. Since then, she vowed never to have the second shot.”

In those instances where an individual received two or more vaccines, this was usually because they had been stopped by security personnel without a vaccine certificate and vaccinated against their wishes. One fisherman described events in the following way:

“I was caught at the landing site, and they said if I don’t vaccinate, I will not go fishing. The second time, I went to the market, [and] I was forced to vaccinate. The third time they vaccinated me at the border post. The fourth time they got me in my village and made me vaccinate. The fifth time they got me along the roadside. I refused and told them to kill me ... it was too much.”

4.1.7. (Un)changing perceptions of COVID-19 vaccines

A small proportion of men and women residing in all study villages were positive about vaccination from the outset. They countered fears and anxieties being expressed with statements such as: “I got the vaccine voluntarily because corona is deadly ... it is a disease that is defeating the wisest people – the whites!”; and “I don’t wish to die now. I want to live and see my great grandchildren.”

A few participants were initially fearful or apprehensive but subsequently changed their minds after they had observed friends and neighbours surviving the vaccine or received a vaccine themselves

without experiencing serious side-effects. Nevertheless, there was widespread concern about the way in which the vaccine programme was enforced. A Baptist leader spoke for many when he said: “In matters of health, there must be no gun. Why is it some diseases like bilharzia, there is no force, but for other diseases, like corona, vaccines are given forcefully, as if we are mad ... even though every one of us minds about our health”. The situation could not have been more different in Gulu, to which attention now turns.

4.2. Case study from peri-urban Gulu, northern Uganda

Gulu city is the main financial and administrative centre for northern Uganda. The city and surrounding districts were profoundly affected by war and conflict between 1996 and 2006. During this time, the Lord’s Resistance Army, led by Josph Kony, forcibly recruited large numbers of Acholi residents with the intention of building an army capable of defeating the Ugandan government. President Museveni responded by requiring Ugandans living in the north to move from villages to internal displacement camps where they could, in theory, be protected by the Ugandan army. At the peak of the conflict, more than 1.2 million people lived in displacement camps in conditions described by the UN Under-Secretary for Humanitarian Affairs as “one of the worst humanitarian disasters in the world” (United Nations, 2003).

Most of these camps have been disbanded, and the majority of inhabitants have returned to their ancestral land. Yet, the legacies of war continue to influence day-to-day lives, albeit in more subtle and hidden ways (Allen et al., 2020; Parker et al., 2021). Acute underlying resentments and antipathies to Museveni’s government remain, with the member of parliament and mayor of peri-urban Pece-Laroo division openly critical of the government. Although some LC1 chairpersons publicly support Museveni’s NRM party, they are perceived to be doing this to safeguard their personal security. Their concerns with the government are widely known. Inevitably, the COVID-19 vaccine programme was influenced by this wider politics.

Most people living in Pece-Laroo division are Acholi. In common with Dei, the majority are involved in the informal sector and they do not receive monthly salaried payments. However, the kinds of economic activities open to residents are more wide-ranging and include diverse businesses, small scale and subsistence farming, and work in the public sector – notably education, health, agriculture, finance and security. With close connections to central Gulu – the largest city in northern Uganda – the economic situation for most residents is less precarious than Dei.

4.2.1. COVID-19 vaccine uptake and coverage

Official data for Pece-Laroo division could not be retrieved, but epidemiological data analysed by King et al. (2023) indicates that 41–60 % of the adult population were officially documented as having one or more vaccines by June 2022 in Gulu district. Findings from the 439 interviewees in our six village surveys is broadly in line with this finding. It revealed that vaccine uptake was 46 %, of whom 21 % had had the Johnson and Johnson vaccine. However, uptake varied between villages. It was 62 %, 60 % and 51 % in Vanguard, Layibi central and Aywee, but it fell to 34 %, 38 % and 40 % in Rom, Cubu and Baromal respectively. These variations are important, and they are discussed further on. However, they do not detract from the point that vaccine uptake was low overall and well below the government target of 70 %.

From a public health perspective, it is also important to note that self-reported coverage of those receiving either one dose of Johnson and Johnson or two doses of AstraZeneca, Pfizer, Moderna or Sinovac was 23 %. This was low across all villages and reported to be 38 %, 38 %, 36 % and 30 % in Vanguard, Aywee, Layibi central and Cubu respectively, and 0 % in both Rom and Baromal.

4.2.2. Fear and anxiety of COVID-19 vaccines

The low overall uptake and coverage rates reflect, in part,

widespread fear and anxiety about the vaccines. In common with participants from Dei sub-county, this was sometimes spoken about in general terms. For example, it was often said that the vaccines were “too strong” and “weakened the body”. Others expressed concern about the impact of the vaccines on reproductive health, asserting that they “killed sperm and destroyed ovaries” and “caused stillbirth and abortions”. Fears for those with chronic health conditions were also widespread, with consensus emerging that COVID-19 vaccines were “very dangerous” for those with HIV, diabetes, and hypertension.

Connecting COVID-19 vaccines with death was commonplace. To quote: “people receiving COVID-19 vaccination are *lupoya* [mad] and looking for death”; “going for COVID-19 vaccination is like *deene* [suicide]”; and “we know that many of the health workers who received COVID-19 vaccination died in the months of June and July [2021] because of the COVID-19 vaccination they received earlier.”

These fears were underpinned by concerns that the vaccines had been developed too quickly, and that they did not provide adequate protection. Participants commented that: “vaccines for measles, polio, meningitis provide complete protection but the covid vaccines provide partial protection ... if you are vaccinated against covid you can still acquire covid and even die”; and “why would I go for a vaccine that I know will not protect me?”

The above fears and concerns were amplified by enduring distrust and antagonism towards President Museveni’s government. Indeed, it was widely held that the government’s endeavour to roll out COVID-19 vaccines was a calculated move to poison the Acholi people. The following kind of comment was frequently made across field sites: “Museveni’s government unpacked the vaccines meant for the Acholi region and put *awola* (poison) in the vaccines before dispatching them. People receiving the COVID-19 vaccine will die a slow death”.

For some, the endeavour to poison the Acholi people was part of a broader political project to assert control, not only in Gulu but in northern Uganda more generally. To quote: “... people know that this government wants to grab our land”; and “In Amuru district and Aswaa ranch [Pader district], government officials were forcing people to receive the vaccine, but what does the office of the RDC have to do with COVID-19 vaccination? Why don’t they leave health matters to the health workers?”

4.2.3. Strategy for rolling out vaccines

Against this background, it is hardly surprising that the majority of people tried to evade vaccination. For those in non-salaried work, this was easier than in Dei sub-county. Neither the military nor police were widely deployed, and threats of physical violence or actual violence were rarely used to make people have a vaccine they did not want. Instead, senior politicians and civil servants played a leading role. The RDC, CAO, DHO and LC5, for example, used local radio and television to promote the national vaccination programme. They made it abundantly clear to those employed in schools, universities, hospitals and smaller health centres that it would not be possible to maintain employment without a vaccine certificate. These pressures were compounded by more general threats that access to health centres, schools and universities would be denied without a vaccination certificate.

Some people succumbed to these pressures, with the following quotes illustrating the main reasons for doing so:

“I would not have gone for the vaccine if it wasn’t for the pressure from Lacor hospital. I was the only caregiver for my mother who is old and sickly. I could not leave her alone” (53-year-old woman);

“I am a businessman ... I have to travel if I am to survive well” (33-year-old man);

“I am an agricultural extension worker. I could not work without a certificate, but I told my wife not to have the vaccine ... [I said:] if I die from the [COVID-19] vaccine, at least you will live to look after our children” (43-year-old man).

Despite these pressures, it proved possible to evade vaccination, particularly in less centrally located villages such as Rom, Cubu and Baromal. Health workers played an important role, primarily through their willingness to issue false vaccine certificates. Although there were a considerable number of health workers (including those working at the two main hospitals in Gulu) who did not do this, participants stated that it was straightforward to purchase a certificate from a health worker – especially if they were working at smaller health centres. The cost ranged from 5,000 to 150,000 Ugandan shillings, with most people paying 20,000 to 50,000 Ugandan shillings. In some cases, a certificate was openly bought at a health centre and in other cases they attended a near-by clinic and a health worker pretended to do the vaccination, by injecting the vaccine into a piece of cotton wool and then recording the person's name in the Ministry of Health's official vaccine registers. Interestingly, COVID-19 vaccination cards were also reported to have been sold from a health facility run by the armed forces; and they were allegedly sold “in bulk” to evangelical pastors who then distributed them during church services.

Several events in Gulu city amplified antipathy towards the COVID-19 vaccination programme. In June 2021, a female paediatrician at Gulu Regional Referral Hospital played a major role in organising the roll out of the vaccine programme. In line with government policy, she received two doses of the AstraZeneca vaccine. Unfortunately, she fell ill with COVID-19 and died. The circumstances of her death fuelled suspicion. Instead of being taken to the near-by private hospital, Lacor, she was transported to Mulago Hospital in Kampala by ambulance and died from a lack of oxygen en route. In June and July 2022, three other prominent figures died in Gulu – two Catholic nuns and the manager of a local radio station. Rumours swirled that their untimely deaths had been caused by vaccination.

These tragic high-profile deaths meant that health workers scrutinised discussions about the safety and efficacy of COVID-19 vaccines. With easy access to global media, they followed discussions taking place in Europe and USA about the risks of blood clotting and deaths associated with administering AstraZeneca vaccines; and they voiced concerns about the fact that AstraZeneca vaccines were being distributed to populations in northern Uganda, while other purportedly ‘better’ vaccines (Pfizer, Moderna, Johnson and Johnson) were being distributed to southern and south-western Uganda – places which were known to be supportive of President Museveni's NRM party. This, in turn, fuelled wider political concerns that President Museveni was using the opportunities created by the COVID-19 pandemic to assert his authority over the region at the expense of Acholi peoples' health and well-being. Given the history of protracted war and conflict, it is perhaps unsurprising that rejecting the vaccine became a way of asserting *Acholiness*.

4.2.4. (Un)changing perceptions of vaccines

Fear of the vaccines gradually dissipated. In part, this was due to recognition that the increasing number of hospital cases and deaths in the city of Gulu during the second wave of COVID-19 was due to the virus rather than the vaccine. To quote: “when I received my first dose, COVID-19 was killing very many people ... I went voluntarily because I thought it would protect me”; and “I have a small kiosk near Gulu hospital. I saw how people died of COVID-19. That is what made me go and receive the vaccine”.

Others, having initially rejected the vaccine, changed their minds. They had either observed friends and relatives being vaccinated without side-effects or they had been given the opportunity to receive the Johnson and Johnson vaccine. To quote: “I never wanted to go for ... vaccination because I was told that available vaccines like AstraZeneca was not safe ... later, I heard that safe COVID-19 vaccines like Johnson and Johnson was available ... I went and received it”. Nevertheless, enduring concerns remained for the majority of study participants, partly because “they would not force people if the COVID vaccines were good”.

5. Discussion

This article has analysed the different ways in which public authority influenced the roll out of the mandatory COVID-19 vaccination programme at contrasting field sites in rural Dei, northwestern Uganda and peri-urban Gulu, northern Uganda. By foregrounding socio-political dynamics that are often set aside or hidden from view, our research revealed the following points.

First, there was widespread questioning of official health communication messages and government directives requiring adults to be vaccinated against COVID-19 across field sites; and they tended to reinforce fears and anxieties in similar ways to those identified by Vanderslott et al. (2022) in vaccine programmes elsewhere. In Dei and Gulu, similar concerns about the vaccines were reported, although participants in peri-urban Gulu were more likely to equate COVID-19 vaccines with a political endeavour to deliberately poison, kill or harm local people. This is not to suggest that there was no demand for the vaccine, but fears and concerns about negative immediate and longer-term impacts of COVID-19 vaccines dominated.

Second, COVID-19 vaccination levels varied widely. In rural Dei, self-reported uptake and coverage both exceeded 70 %, while in peri-urban Gulu, self-reported uptake was below 50 % with overall coverage at 23 %. The contrast in rates is particularly interesting, given that no deaths, and hardly any cases were attributed to COVID-19 by health professionals in Dei or other parts of Pakwach district; while in Gulu, deaths and cases were widely reported on news and social media, especially during the second wave in May–August 2021.

Third, contrasting socio-political dynamics shed light on these differences. In rural Dei, the armed forces played a major role enforcing lockdowns, and they further asserted their authority by imposing national policies to regulate fishing on Lake Albert. This involved working closely with the police, immigration and security officers, and members of the FPU. Given these strong working relationships, it was relatively straightforward to enlist their support with the vaccination programme. While a few of these officials expressed doubts during interviews about the merits of requiring all adults to be vaccinated for COVID-19, they were all directly benefitting from NRM patronage, and they were unwilling to challenge government policy. Other influential figures of public authority were directly pressurised, coopted, or sidelined. For example, religious leaders were threatened with the closure of mosques and churches unless they acquiesced. Meanwhile, VHTs and LC1's operating at a distance from the centre had no voice and were sidelined or in some cases, co-opted with promises of remuneration. Sustained open resistance was minimal, because people were acutely aware of the adverse consequences that would follow from dissent. In other words, the high uptake figures reported in most parts of Dei reflects the difficulty of avoiding vaccination in a highly militarised context, with political dynamics and fear making resistance difficult. The situation was different in peri-urban Gulu. Protracted war and conflict in northern Uganda had affected the area. Antipathy to the government was common, and distrust of the government's intentions pervasive, even among some officials ostensibly holding NRM positions. Rejecting the vaccine thus became a way of asserting *Acholiness*. Given the dispersed settlements which constitute Gulu, which are interlinked with multiple tracks and pathways, it would have been very difficult for the military to enforce the programme effectively without a major deployment of soldiers. Instead, senior political leaders and civil servants attempted to pressurise people to come forward for the vaccine. However, their endeavours were often undermined by the availability of false vaccine certificates.

These contrasting findings would not have emerged without an explicit focus on public authority. Unsurprisingly, they mirror some of the same issues raised by the broader dynamics of militarised public health programmes in Uganda and elsewhere (Allen and Parker, 2023; Renne, 2017). However, the research extends these analyses further by revealing how, and why, a national programme, which purports to be for

all citizens, ends up having such diverse local impacts in different parts of the country. It also raises important questions about the wider public health and political impacts of vaccine enforcement for Uganda and elsewhere. With respect to public health, our findings suggest that it would be a mistake to equate 'success' with high vaccine uptake and coverage, and 'failure' with low vaccine uptake and coverage. For a start, such metrics are unlikely to be an accurate reflection of actual coverage as the accounts of multiple vaccines forced on individuals, or the purchasing of certificates without receiving any dose suggest. Furthermore, although militarised enforcement ensured that vaccine uptake and coverage was high in Dei, it does not follow that the approach significantly mitigated a COVID-19 outbreak in the area. On the contrary, our data suggests that the late arrival of the vaccines meant that only 4 % of the 77 % of vaccinated adults, received a vaccine before the second outbreak in May–August 2021. A further 28 % of vaccinated adults received their first vaccine after this outbreak but before the third outbreak in December 2021–January 2022, 21 % received a vaccine during the third outbreak and 47 % after the third, and final, outbreak had passed through Uganda. In other words, neither uptake nor coverage were close to the 70 % coverage levels recommended by the WHO when these different outbreaks passed through Uganda. This does not mean that vaccination had no influence on mortality, morbidity or transmission dynamics. However, locally employed health professionals suggested that covid-related morbidity was absent and transmission prior to the arrival of the vaccines was very low. It is thus likely that the high rates of vaccination had minimal impacts on the course of the second and third outbreaks, but it would have mitigated the impact of a fourth outbreak, if one had occurred.

The situation was different in peri-urban Gulu. Here, enforcement relied on a combination of persuasion and threats to damage the livelihoods of those who refused the vaccine. The latter did not work as neither uptake nor coverage came close to reaching 70 %. Moreover, when the second outbreak occurred in May–August 2021, only 9 % of the 46 % of vaccinated adults had received one or more vaccines. A further 41 % of these 46 % were vaccinated before the third outbreak, 5 % during the outbreak, and 45 % at the end of the outbreak. Given the low overall levels of vaccination and the late arrival of vaccines, it is also unlikely that vaccination mitigated the second and third outbreaks. Interestingly, these findings corroborate those reported by Laing et al. (2024). They mapped a range of public health and social measures (such as lockdown) onto Uganda's epidemic curves and concluded that while it was unclear whether the measures had had an impact on the first outbreak, it was likely that the measures had had little or no impact on the second and third outbreaks.

Ethnographic findings presented in this article highlight the importance of moving away from a small number of public health indicators (such as vaccine uptake and coverage, and disease rates) when assessing vaccination programmes. It reinforces points made by numerous scholars (e.g. Adams, 2016; Rottenburg et al., 2015) about the importance of analysing the socio-political issues shaping both the production and interpretation of these kinds of indicators, and who is gaining and losing from them. 'Success' in this reading then encompasses not only public health or health security aims but also the achievement of the various political purposes of different formal and informal public authorities across scales.

Reflecting on the longer-term impacts of enforcement for other public health programmes, it is noteworthy that many participants, across field sites, were unclear why enforcement had been deemed appropriate. Concerns linger and these may well have unforeseen consequences for other vaccination programmes. In early 2024, for example, yellow fever vaccination coverage was reported to be low across the country. The government responded by threatening to remove non-vaccinated teachers and health care workers from the payroll, if they could not prove that they had been vaccinated (Abet, 2024). Such threats have (again) entrenched, rather than mitigated, some of the concerns identified by Huebl et al. (2024) prior to COVID-19 pandemic

(such as a paucity of reliable information about the vaccine and concerns with the politicisation of the yellow fever programme); and the approach has done little to increase coverage.

Worryingly, childhood vaccinations may also have been affected. In April 2024, officials from the Ministry of Health stated that "the number of children who have never been vaccinated with a routine vaccine has almost doubled in the last two years" (Abet, 2024). Such findings may also be connected to the deleterious impacts which arose during the COVID-19 lockdowns, including declining attendance at antenatal, postnatal and family planning clinics (Musoke et al., 2023), and routine neo-natal vaccination (Burt et al., 2021).

There is, then, a growing body of work which suggests that enforcement, whether involving physical violence or threats to livelihoods, has had counter-productive health impacts, and may continue to do so; an issue that merits further research. However, there were other intended impacts in Uganda of a more political nature that need to be considered when assessing for whom enforcement might work.

It was evident before the first batch of vaccines arrived that Ugandans were less at risk of severe morbidity and mortality, compared to populations in Europe and USA; and that ongoing outbreaks of infectious disease such as malaria and TB potentially posed more serious public health challenges. Compared to these diseases, COVID-19 morbidity and mortality was relatively low. By the end of the third outbreak in February 2022, there were 161,839 cases and 3,533 recorded deaths (<https://coronavirus.jhu.edu/region/uganda>), albeit figures likely affected by the availability of testing. In this context, the politics shaping national decision-making sheds light on the continued enforcement of the COVID-19 vaccination programme into late 2022.

President Museveni came to power almost 40 years ago. Although seven elections have been held during this time, it is widely recognised that he has used his tenure to strengthen authoritarian rule (Fisher and Anderson, 2015). Our research suggests that the endeavour to hollow out democratic processes remains on-going. Indeed, locally elected councils, which were introduced by his government in the 1980s, are being co-opted with offers of patronage. Even in areas of the country that were not supportive of the NRM in the past, which is this case for both of our field sites, local councils have often been drawn into implementing government policy and working with the army, even when their constituents have been targeted. Like the President, they have found alternative ways to remain in office.

Ugandans are aware of these machinations, and that invites scepticism about the 'real agenda' underpinning what purports to be well-intended public health initiatives. Thus, while people across field sites recognised that it is sometimes necessary to enforce regulations to safeguard public health, there was widespread concern about the way in which enforcement occurred and the wider political agenda it promoted. In Dei, this included soldiers violently asserting their authority and abusing the local council system to extract money, goods or sexual favours in the knowledge that they would never be held to account for their actions. In peri-urban Gulu, enforcement measures were subverted more easily, amidst a heightened recognition that government officials and the armed forces were likely being used to assert state control at the expense of safeguarding the public's health.

Mobilising COVID-19 vaccination programmes for political purposes is not unique to Uganda. The governments of Rwanda, Nigeria, Brazil, Philippines and Indonesia are reported to have used the armed forces to roll out COVID-19 vaccines. To our knowledge, research has not occurred in these places, but accounts by journalists suggest that similar issues have arisen. Neighbouring Rwanda, for example, reported high vaccine COVID-19 coverage rates, but police enforcement was reported to be violent (e.g. Ngarambe and Steinwehr, 2022). Meanwhile, China has led the way in promoting the use of the military for vaccines as a positive trajectory, collaborating with the armies of other countries as an aspect of its COVID-19-related strategies, and thereby extending the responsibility of the Chinese armed forces in promoting China's national security cooperation and diplomatic efforts, as per President Xi Jinping's

instructions in 2015 (Nouwens, 2021). With China's growing influence in global health, and the advantages potentially accruing to governments aiming to entrench their positions and promote their authority, further expansion of militarised vaccination is likely. Whether it will have positive health outcomes is perhaps viewed as a secondary matter. The Ugandan evidence suggests it is unlikely.

6. Conclusion

Vaccine enforcement takes many forms, ranging from requiring proof of vaccination to access public spaces to physically beating people until they succumb to being injected. It is not a socially homogeneous project. In instances where enforcement is instrumentally violent, it is likely to be among more politically marginal groups and those less visible in the media. Gauging the success or otherwise of these different strategies depends on the criteria for assessment. If emphasis is solely given to relating enforcement strategies to data documenting vaccine uptake, then it could be argued that deploying the military to vaccinate citizens, sometimes in ways that violate their basic rights, is an effective strategy. Arguably, the public health potential of that approach is highlighted in the high uptake data from Dei. Meanwhile, data from Gulu suggests that the obverse is also true. Not using soldiers, and relying on official, non-military figures of public authority to threaten people with the loss of salaried employment and/or access to public spaces is much less effective. The implication is that enforcement by soldiers works and is a model to duplicate. However, such a conclusion is both superficial and misguided. It ignores the public authority dynamics and geographical contexts shaping enforcement activities. Deploying soldiers proved possible in Dei because the population's concerns and fears could be ignored. It was not a politically feasible option in Gulu and it would have been much more difficult to implement. Moreover, the high vaccination uptake in Dei may have potentially adverse consequences, such as fueling concerns about other vaccines. Essentially, soldiers enforcing vaccination only 'works' if the population cannot resist, and if the militarised enforcement is sustained and applied more generally to other aspects of public health. It is hard to see how the Ugandan government could maintain such draconian social control. In Dei, the soldiers have already gone back to their barracks. Taken together, these findings underscore the point that public health is a political project, and profoundly shaped by public authority dynamics. Vaccination efforts in the context of an epidemic have to be understood in ways that go beyond a focus on outcomes and metrics.

CRediT authorship contribution statement

Melissa Parker: Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Bob Okello:** Writing – review & editing, Supervision, Methodology, Investigation, Formal analysis, Conceptualization. **Peter Kermundu:** Writing – review & editing, Investigation, Conceptualization. **Bono E. Ozunga:** Writing – original draft, Supervision, Investigation, Conceptualization. **Moses Baluku:** Writing – review & editing, Investigation, Conceptualization. **Grace Akello:** Writing – review & editing, Investigation, Conceptualization. **Hayley MacGregor:** Writing – review & editing, Funding acquisition, Conceptualization. **Melissa Leach:** Writing – review & editing, Funding acquisition, Conceptualization. **Tim Allen:** Writing – original draft, Investigation, Funding acquisition, Conceptualization.

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Data availability

The data that has been used is confidential.

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