

**TRANSPARENCY AND CORRUPTION IN COVID-19 VACCINE DEPLOYMENT:
EVIDENCE FROM BANGLADESH, UGANDA, AND ZAMBIA**

Transparency International (TI) is the world's leading non-governmental anti-corruption organisation, addressing corruption and corruption risk in its many forms through a network of more than 100 national chapters worldwide.

Transparency International Global Health Programme's (TI GH) overall goal is to improve global health and healthcare outcomes for the benefit of all people, of all ages. It aims to achieve this by reducing corruption and promoting transparency, integrity and accountability within the pharmaceutical and healthcare sectors.

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Front image: Map shows vaccination per one hundred people by country – base map from Elastic Map Services

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INTRODUCTION

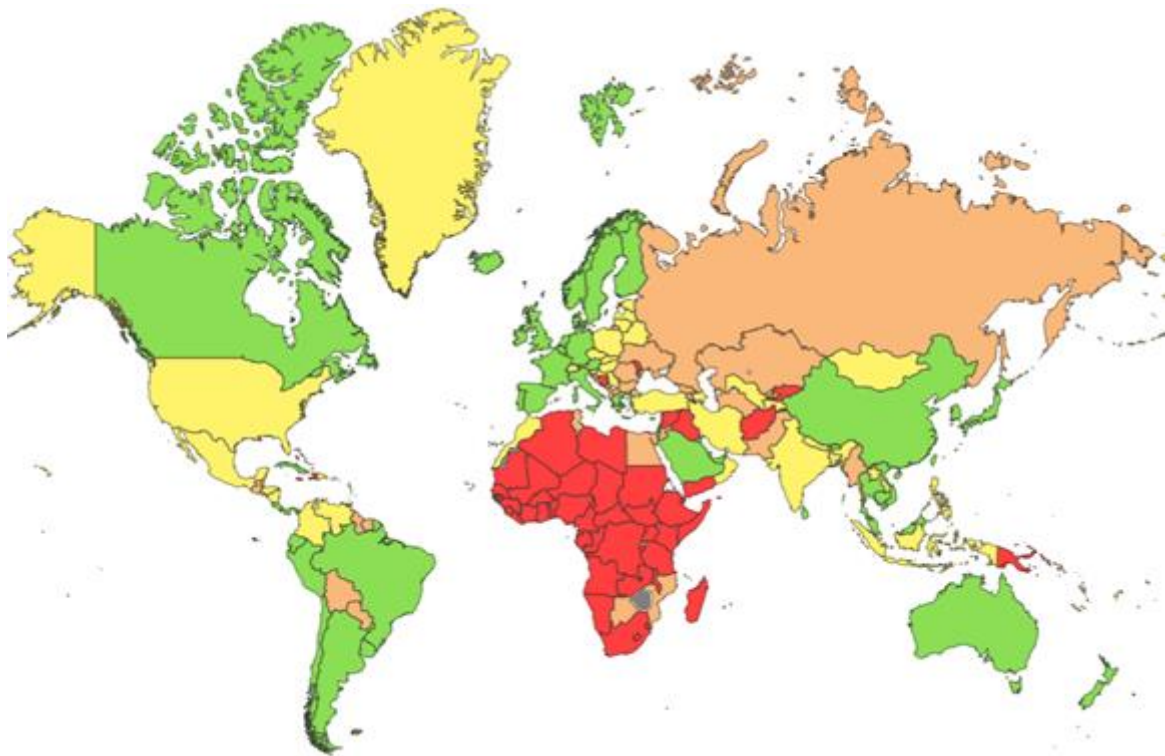
This report focuses on corruption in the rollout of the COVID-19 vaccine in three different focus countries: Bangladesh, Uganda and Zambia. It aims to shed light on the prevalence of different types of corruption in relation to the rollout, discuss their potential drivers, as well as exploring prospective avenues for their prevention and mitigation.

The report reviews three types of corruption in regard to the COVID-19 vaccine rollout: bribery, corrupt fraud and embezzlement and diversion. Our analysis is based on primary data, reports and observations collected as part of our work in the three countries. We triangulated findings with a systematic review of peer-reviewed literature as well as online news reports. The report aims to contribute to the rapidly developing evidence base on the COVID-19 vaccine rollout by offering a perspective that has so far often been overlooked and neglected: the widespread prevalence and adverse impact of corruption. Beyond COVID-19, the report is intended to expand our understanding of corruption in the health sector and offer some novel insights into the issue of corruption in vaccine delivery.

Background

The rollout of the COVID-19 vaccines has required an unprecedented public health response. Huge amounts of public resources have been spent on their development, purchasing and distribution around the world.

In 2021, 11 billion COVID-19 vaccine doses were produced, enough to fully vaccinate every adult on the planetⁱ. Yet, despite such tremendous advances in the development and production of vaccines, there is great inequity in their global distribution. Whilst many high-income countries are discussing fourth doses, only 17.4% of people in low-income countries have received at least one dose (as of 11th May 2022)ⁱⁱ. If the world is to meet the WHO target of vaccinating 70% of the world's population by mid-2022ⁱⁱⁱ, there is an urgent need to focus efforts on getting the last-mile planning and distribution of vaccines right. It is critical that processes are put in place which will ensure that the most vulnerable or high-risk groups are not left behind in the vaccination process due to their socioeconomic status, literacy or access to information.



Map 1. Total Vaccinations per 100 People. Red 0 – 59, Orange 60-119, Yellow 120-179, Green 180+. Data from Our world in Data

In Bangladesh, Uganda and Zambia, where the Transparency International Global Health Programme (TI-GH) has been working to increase transparency and equity in the COVID-19 vaccine rollout, the picture is mixed. The three countries commenced vaccination programmes in February^{iv}, March^v and April^{vi} 2021 respectively. In all three, the initial rollout was slow, but there have been marked differences in progress.

In Bangladesh (Figure 2), the rollout gathered pace in August 2021, and by the 11th May 2022, 77.4% of the total population had received at least one dose of the vaccine, with 154.49 doses per 100 persons of the vaccine had been administered. 70.1% had received the full initial vaccination coverage (two doses), whilst an additional 7.3% had been vaccinated once.

In Uganda and Zambia (Figure 2), the uptake has been much slower. 33.2% of the total population had received at least one dose of the vaccine by the 11th May 2022 in Uganda, of which only 22.4% had received full initial coverage and 10.8% had received one dose^{vii}. In Zambia, only 17.1% of the total population had received at least one dose of the vaccine by the 8th May 2022, with 13.2% having received full initial coverage and 3.9% having received one dose^{viii}.

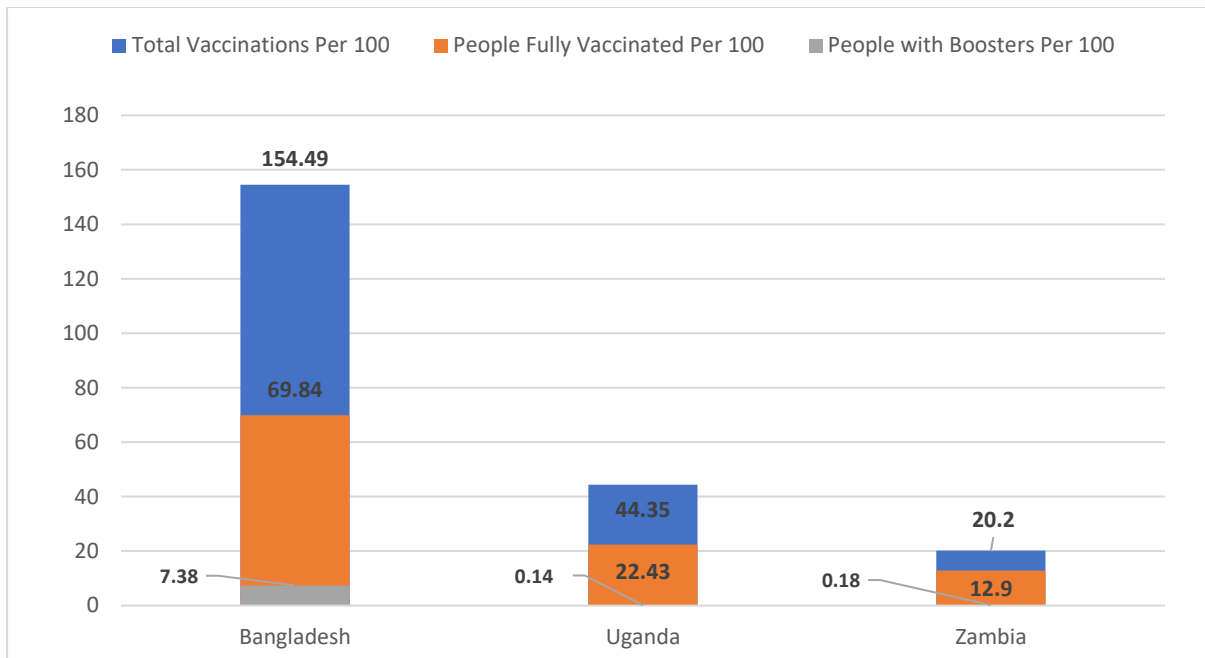


Figure 1. Vaccination Rate Breakdown of Focus Countries (as of 11/05/2022) ^{ix}

The slow uptake in Uganda and Zambia has led governments to change their rollout strategy: Concerns that the vaccines could not be used before their expiry date, which were fuelled by uncertain and opaque delivery schedules as well as donations being made on very short notice^x, led to the abandonment of a prioritised distribution approach in all three countries. However, governments have not addressed this formally with updated communications, leaving a policy gap in vaccination prioritisation.

With prioritisation based on age, occupation, underlying health conditions, and other vulnerabilities being abandoned in favour of ensuring that the distribution of the vaccine happens as quickly as possible, this has reduced equitable access to the vaccine, as the most vulnerable groups have had to compete for access with everyone else, including elite groups – indications of which have been seen in Bangladesh and Uganda.

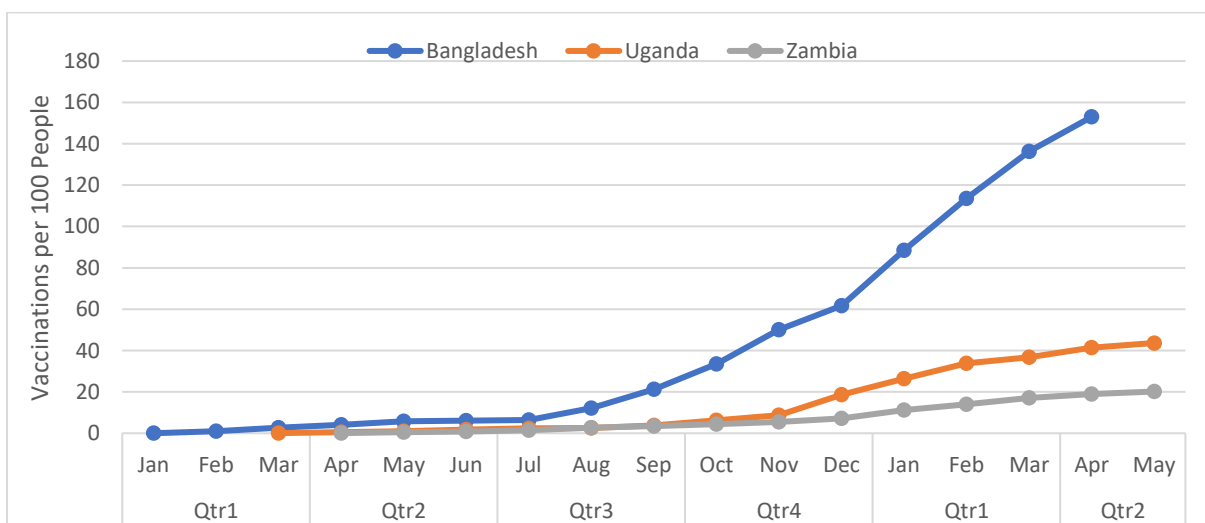


Figure 21. Number of Vaccinations per 100 People over Time in our Focus Countries^{xi}

Methodology

The data for this report was collected between the 1st of April and 11th May 2022. The report covers a research period of 1st January 2021, the beginning of TI-GH's project work in the three focus countries, and the 31st of March 2022.

Evidence was compiled from five sources:

1. Three **surveys** consisting of short questionnaires that looked at ease of access, experiences of corruption, and perceptions of the vaccination process whilst collecting sociodemographic and vaccination data of the participants. They were conducted across 43 districts in Bangladesh, 10 in Uganda and nine in Zambia, with 3394 (Bangladesh), 5607 (Uganda) and 365 (Zambia) respondents respectively. The participants were selected randomly. Some were identified at vaccination centres based on their proof of vaccination, whilst unvaccinated respondents were approached through a snowball system. The aim of the surveys was to improve our understanding of which issues were perceived by the populations themselves, in order to be able to design more targeted responses.
2. **Case reports** through whistle-blower hotlines or corruption reporting mechanisms operated by TI.
3. An **Artificial Intelligence Monitoring Tool (AIMON)** which tracked, collated, and categorised over 5 million online news articles worldwide on corruption in the rollout of COVID-19 vaccines per day. AIMON collects articles from over 100,000 sources across the globe – identifying, on average, approximately 20,000 articles on corruption daily.
4. A **literature review** of academic and grey literature on corruption in the COVID-19 vaccine rollout in Bangladesh, Uganda and Zambia. The full methodology for this can be found in Annex 4.
5. **Chapter Reports** including updates and findings on all activities from TI chapters operating in the three countries. These consist of quarterly reports, workplans, call notes, case studies, vaccination, and vaccine delivery data

The purpose behind using data from these broad range of sources was to cast a wide net and begin to unpick corruption trends as they happened, with a view to mitigating them in real time rather than waiting for more in-depth studies and having to work retrospectively. Literature reviews were used to obtain academic theory on corruption and inequity in the rollout. This was then complemented with data from the other four sources, which described the reality of experiences. Whilst this broad approach means that this report has been able to capture a variety of different perspectives on the rollout, this also means that this report cannot provide detailed insight into one type of source material, e.g., it did not allow for an extensive and in-depth literature review.

Limitations

Access to data and information on documented cases of corruption is limited. It is likely that some types of corruption, due to their clandestine nature and complex subject matter, are generally under-reported or not reported at all.

Furthermore, there is a scarcity of academic and scientific literature on drivers for corruption in the COVID-19 vaccine rollout. Whilst there is a quickly growing set of literature on vaccine

hesitancy and the motivation for getting vaccinated in different countries, very few of these articles consider corruption as a potential hindrance, and peer-reviewed literature on corruption in the rollout as such is lacking.

Consequentially, the report heavily relies on information from Transparency International Chapters and news reports, which are more prone to bias and less likely to provide a complete picture as some stories might not have been considered newsworthy or considered controversial. As AIMON also only picks up online news reports, other forms of media coverage are thus not represented in the report. This may result in large gaps in knowledge.

This research report hence does not provide a full overview on corruption cases in the focus countries and is likely to be subject to large knowledge gaps. It is likely that types and cases of corruption have been going on that have not been picked up by any of our sources.

Corruption categories

The focus of this report is on three corruption categories: bribery related to vaccine delivery; corrupt fraud; and embezzlement and diversion. These categories were selected through a two-stage process. In the first stage, we examined, and classified our data sources according to the six corruption categories identified in the UNODC (2020) publication 'COVID-19 Vaccines and Corruption Risks: Preventing Corruption in the Manufacture, Allocation and Distribution of Vaccines'^{xii}, which defines corrupt procurement; nepotism; favouritism; diversion of emergency funding assigned to the vaccine development and deployment; vaccine theft; and the emergence of substandard and falsified vaccines as the main corruption risks in the vaccine rollout.

Based on these initial findings, we conducted a vulnerability assessment to ascertain the likelihood, and impact of corruption in the above categories. Questionnaires were developed, and completed by over 30 non-governmental organisations with expertise in equity and governance in the three countries. Based upon the results of the assessment as well as the data availability for each category, we refined our research scope to below three categories:

1. Bribery related to vaccine delivery
2. Corrupt fraud
3. Embezzlement and diversion

The full definition for these categories is in Annex 2. Data on bribery related to the delivery of vaccines to individuals was collected through community surveys, in which vaccinated respondents were asked if they had paid a bribe to obtain the vaccine. All three categories involve the analysis of case reports, i.e., cases or complaints that were made directly through TI corruption reporting mechanisms in the three focus countries. 17 cases were obtained through AIMON as well as through case reports, which can be found in detail in Annex 1. The below analysis looks at both these sources to identify key characteristics and trends of bribery in the delivery of vaccines.

FINDINGS

Bribery relating to vaccine delivery

Bribery represents an unsurmountable barrier for the poor, and is more likely present a barrier to those that are “doubly unlucky”

The results of our community surveys show a complex picture of bribery. Each survey from the focus countries asked whether the vaccine recipient had to give a bribe to access the vaccine¹. The bribery rates per country are presented below.

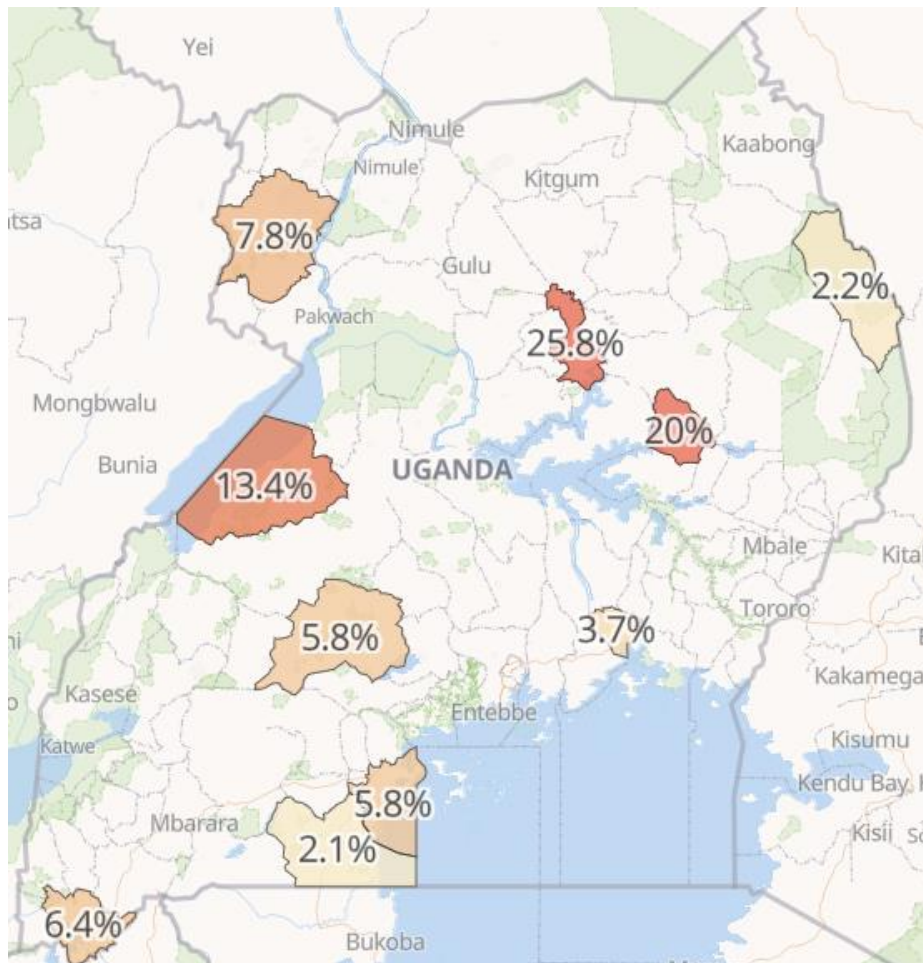
Country	Percentage	N value
Bangladesh		3394
Did Not Give Bribe for Vaccine	99.79%	3387
Gave Bribe for Vaccine	0.21%	7
Uganda		5607
Did Not Give Bribe for Vaccine	89.89%	5040
Gave Bribe for Vaccine	10.11%	567
Zambia		365
Did Not Give Bribe for Vaccine	98.36%	359
Gave Bribe for Vaccine	1.64%	6
Grand Total		9366

Table 1. Breakdown of Bribery Rates by Country

Such percentages may seem small from a national perspective, with an average of 4% across the three countries, but in the case of Uganda, where 10.1% of the respondents indicated having paid a bribe for the vaccine, this figure would amount to 1.4 million people if representative of the entire country. Questions were only asked on whether individuals had paid a bribe, responses do not capture those that refused or could not participate in bribery. Results are therefore likely to underestimate the extent to which bribery has restricted access to COVID-19 vaccinations.

County	Arua	Hoima	Jinja	Kabale	Rakai	Lira	Masaka	Moroto	Mubende	Soroti
Gave Bribe	35	47	35	53	9	192	34	9	8	142
Total Responses	450	351	939	826	435	743	588	413	139	711
Percentage	7.80%	13.40%	3.70%	6.40%	2.10%	25.80%	5.80%	2.20%	5.80%	20.00%

Table 2. Bribery Rates for Accessing Vaccination in Select Ugandan Districts



Map 2. Bribery Rates for Accessing Vaccination in Select Ugandan Districts – Elastic Maps Service

Response rates for Bangladesh and Zambia were too low to allow for statistical analysis. We analysed data from Uganda, where response rates were higher. Here, by comparing bribery rates to demographic information such as the geographic location of respondents, we found that certain population groups within these geographical locations are at a comparatively higher risk than others.

When disaggregating the data by district and clinic, further inequities become apparent. Map 2 shows that in one district (Lira), 25.8% of respondents reported having paid a bribe or facilitation fee to access the vaccine. In some clinics, such as Butagaya and Kyanamira HCIII, the proportion of respondents who reported having had to pay a bribe or facilitation fee was 51% (n=37) and 65% (n=46), respectively.

The reasons for such geographical clustering are not conclusive but seem to be partially related to poverty levels within those areas. Simple linear regression analysis, i.e., comparing levels of poverty and rates of reported bribery per district, found that the relationship can be described as statistically significant with a p-value below 0.05 of 0.03. In other words, a higher poverty rate is likely associated with a lower presence of bribery.

Further research into the reasons for this correlation could provide important insights into the descriptive factors of bribery. From our experience this relationship is likely to be at least partly explained by one or both of the following:

- a lack of profitable market for bribery in the areas with higher levels of poverty, i.e., that the poorest have limited ability to pay bribes.
- that bribes are also demanded in these areas, but unaffordable to much of the population, which are therefore restricted from vaccination.

Further is required into the drivers of bribery, and would allow for a better understanding of the relationship between incomes, markets, and bribery. Topics for consideration could include how markets and poverty facilitate bribery, and mapping of the impact bribery has on restricting access to healthcare.

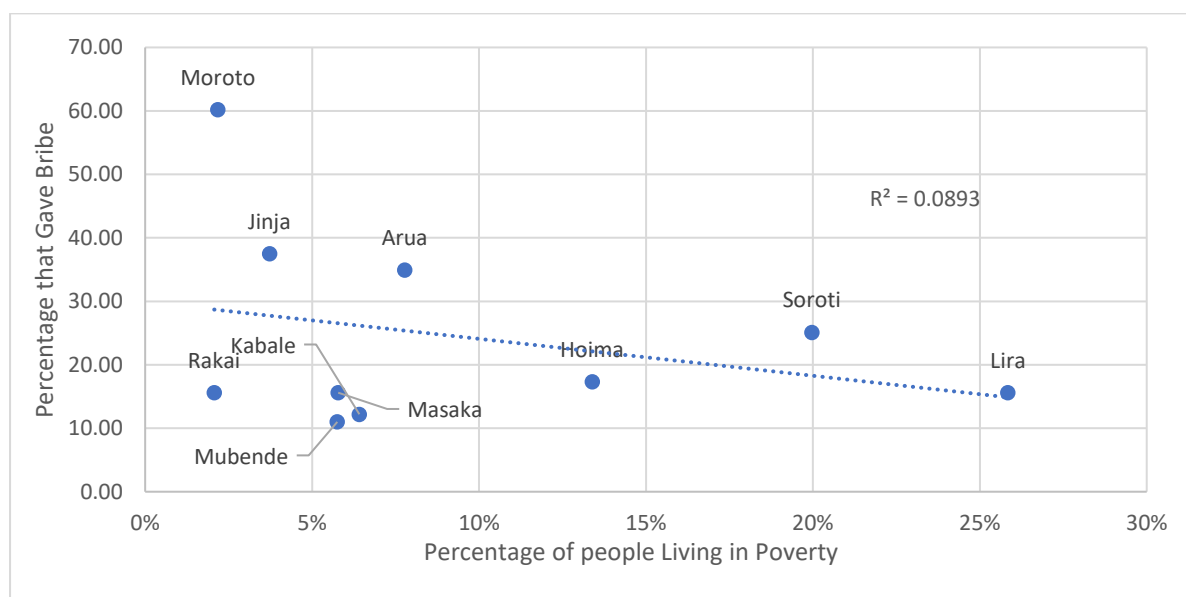


Figure 2. Relationship between Bribery Rates and People Living In Poverty by Select Ugandan Districts

Eight out of seventeen case reports (cases 2, 3, 4, 7, 8, 9, 12 & 17) implied mass solicitation of bribes, where a facility or an official refused access to vaccination unless payment was made. Even in the case where the monetary value was the lowest, the amount needed to fulfil the bribe at the Kiwingala facility for a full course of vaccination could be as high as 95% of the money earned per day on average of those living on the national poverty line^{xiii}. Considering that around 21% of the population of Uganda lived below this line in 2016 - a rate which is predicted to have increased since the outbreak of the pandemic -, and an additional 43% classified as 'vulnerable' due to earning less than double the national poverty line^{xiv}, the solicitation of bribes is likely to be an impediment to those economically disadvantaged accessing vaccine in the benefit of those who are wealthier.

The above analysis shows that bribery is likely an impediment for those that are poor, and that some within this group would be "doubly unlucky" by residing in a geographical bribery hotspot – further limiting their access to the vaccine.

Bribes for certificates, not just vaccinations

Our research also found that bribery is not just limited to bribes to access the vaccine. Whilst bribery to jump the queue has direct impact on equity, providing certificates without vaccination has deeper public health implications.^{xv}

We found instances of bribes being paid to obtain a vaccination certificate without having received the vaccine. In total, five instances were recorded across Uganda and Bangladesh (cases 7, 8, 9, 11 & 17). Via this methodology, it is not possible to determine prevalence or whether such cases were localised around particular groups, communities, businesses, or health facilities, which if they are, may create situations where seemingly vaccinated groups become a nexus for contagion.

Motivation for paying a bribe to receive a certificate despite not being vaccinated is hard to determine. There are a number of possible internal and external drivers, including:

- **Internal drivers:** Vaccine refusal based on personal beliefs, misinformation, public mistrust, mistrust in vaccines, low fear of infection, and other reasons, collide with the need for proof of vaccination. This could be either for travel or to access activities and services where proof of vaccination is needed^{xvi}.
- **External drivers:** Inability to access vaccines (despite wanting to get vaccinated) in contexts where vaccine mandates have been put in place by for example government or an individual's place of work can also incentivise purchases of falsified certificates.^{xvii} Supply shortages, shortage of healthcare staff, and weaknesses in the health system such as poor governance or limited infrastructure may all contribute to inability to access. which limit or prevent adequate storing or transportation of vaccines to remote areas. Global inequity in access to vaccines thereby directly contributes to the supply shortages as low-income countries often do not have the budget to purchase sufficient quantities of vaccines themselves and are therefore reliant on donations. With only a fraction of the promised donations having been delivered, those who require the vaccine for travel abroad urgently or to circumvent local regulations could have no other option than to purchase falsified vaccines certificate. Global inequitable access to COVID-19 vaccines thereby risks contributing to corruption in the COVID-19 vaccine roll out and ultimately a more ineffective response to the pandemic.

Regardless of the underlying motivation, falsified certificates have far-reaching complications for the vaccine rollout and the ultimate goal of ending the pandemic. Those obtaining a fake certificate become a health threat to both themselves and their communities. If such acts are localised around particular groups associated with, e.g., specific communities, businesses or health facilities, this may create dangerous (sometimes even deadly) situations where seemingly vaccinated population groups can become spreaders.

Where the issuance included entry of false data into government databases, fake vaccine certificates undermine efforts to tackle the disease as official tracking and vaccination data becomes inaccurate. Those who wanted to get vaccinated but obtained a fake vaccination certificate due to external drivers might not see the necessity to get vaccinated once they have the opportunity to, leading to reduced immunisation coverage and potential wastage of vaccine doses.

Lack of understanding of recourse mechanisms is likely reducing the ability of victims of corruption to report it

A lack of understanding of recourse mechanisms for corruption, for example, how to report incidences or concerns of corruption, reduces the number of reports of corruption and limits our understanding of the drivers behind it. This most notably applies to bribery as it is more likely to be directly observed by the everyday citizen, compared to, for example, embezzlement which is likely to occur clandestinely, between a handful of people and only uncovered by specific investigations. It is also linked to increased prevalence of corruption because without effective deterrence systems, corrupt actors have a further incentive.

Experiences from TI chapters in Bangladesh, Uganda and Zambia show that lack of knowledge on how to report corruption and fear of reprisals for doing so limit the utilisation of local TI corruption reporting mechanisms such as toll-free lines^{xviii}. This is corroborated by the results of our community surveys from Uganda and Zambia found that 44% of respondents did not know or feared reprisals for reporting corruption, meaning that many cases of corruption are likely unreported (Table 3).

	Uganda	Zambia
Do not know how to report corruption	23% (n=961)	29% (n=98)
Fear reprisals for reporting corruption	21% (n=874)	15% (n=52)
Total not able to report corruption	44% (n=1835)	44% (n=150)

Table 3. Percentage of People Not Able to Report Corruption That Responded to the Question

Stretched human resource and managerial capacity may be facilitating bribery

In each of the three countries there have been reports that human resource (HR) capacities at vaccination sites are overstretched. In Uganda there were reports of staffing numbers being too low to manage the vaccination process. Staff did not have the time to manage relatively simple processes such as uploading vaccination data to online portals in many sites that they visited. This information has been confirmed by news reports from Uganda^{xix}. Such an insight is also corroborated in the Bangladesh survey data which shows that 21.4% (n=113) of people that reported irregularities in the vaccination process noted the inadequate presence of skilled or administrative workers.

Understaffing and lack of management and supervision structures are generally considered key drivers for bribery at the point of service delivery^{xx}. Therefore, whilst the current data is inconclusive, it indicates that a lack of HR capacity may be undermining the ability of management to deter the solicitation of bribes^{xxi}.

Corrupt fraud

Fake COVID-19 vaccines exist, have a profitable market, and represent a serious health risk

We identified four reported cases of fake vaccines in the three countries. Three cases in Uganda (cases 5, 6, 16) and one case in Zambia (case 10). There were no case reports to the TI-operated reporting mechanisms, nor were there any direct reports made to TI chapters in the three countries on this topic. The prevalent trend in these cases was that corrupt actors used or fabricated a position of entrusted power to deceive a vaccine seeker for monetary gain. Individuals would be led to believe they had been properly vaccinated. This implicates a financial loss for those who paid for the vaccinations, as well as a severe health risk as the affected persons are unlikely to get properly vaccinated in the future. This type of corruption was seen in cases 5 and 10.

These cases indicate a serious risk that that people will take advantage of the relative shortage and demand to illicitly enrich themselves, at the expense the health of vaccine seekers. Case 5 from Uganda is a particularly noteworthy, given that 800 people were vaccinated with non-medical grade substances, and highlights the potential health impact of such a scheme.

Each case of fake vaccines was identifiable to the trained eye

One important observation of these cases is that all were detectable relatively easily. In cases 1 and 2, the Substandard and Falsified (SF) vaccines were visibly identifiable due to inconsistencies in the labelling and dosage. In case 3, the perpetrators were identified as posing to be health workers after pretending to inject the vaccine. This has important ramifications for the potential of monitoring and identifying fake vaccines that is discussed below.

Embezzlement and diversion

Diversion to sell vaccines privately

Two of the cases identified through AIMON on the topic of embezzlement and diversion detail how vaccines have been diverted along supply chains into either private clinics or the black market. Again, due to the clandestine nature of this process and the lack of public information on vaccine stock management, we do not know the prevalence of such diversion. However, experience and previous evidence from our work suggests that the issue could be widespread. In 1999, a study of Ugandan healthcare centres detected that at nine out of ten health centres, less than half of supplied drugs actually reached patients; overall there was a median drug leakage rate of 76%^{xxii}. In 2015, the Malawian Minister of Health stated that approximately one third of medicines within the countries' public health system go missing^{xxiii}, and there have been reports of malaria medicines supplied for public use being diverted to the private sector in multiple countries^{xxiv}.

The impact of diversion in the health sector is severe^{xxv}. When HIV testing kits go missing due to theft, those infected may unwittingly spread the virus to other people. Stock-outs of free contraceptives may also lead to new infections. Interruptions in treatment regimes for HIV, malaria and tuberculosis can lead to the development of drug resistance, with drug-resistant strains subsequently spreading through the wider population. As costly second-line treatments are often not locally available, those infected are effectively condemned to death. In addition, frequent stock-outs can incentivise patients to hoard drugs at home which further compounds drug shortages. One study found indications that only 20% of the people collecting free malaria drugs in Uganda were genuine patients. The other 80% were mostly stockpiling the free drugs in case of future urgent need^{xxvi}.

The two cases retrieved by AIMON were reported in June 2021, and we have seen no reports since then. This is possibly due to the increase in availability of vaccines through the public system, which has resulted in a decline in monetary value, and market for fake vaccines.

Diversions of vaccine certificates for sale

As detailed above in the bribery section, vaccine certificates appear to have a value that props up illicit markets. Another distinct corrupt act that supports these markets appears to be the diversion of vaccine certificates along formal supply chains rather than complete fabrications – this is seen in case 15, where vaccination cards along with vaccines were taken from the government stores.

Separately but perhaps connected are the several informal reports picked up by Transparency International Uganda of people receiving vaccination cards and being uploaded onto the Ministry of Health portal without being vaccinated^{xxvii}. Additionally, it has been noted that vaccination cards have been consistently delivered in insufficient quantities compared to the number of vaccines. Whilst not provable via our data collection methodology, the evidence from cases of formally official certificates raises the possibility that they are being diverted, either to health officials or on the black-market, to allow for the generation of illicit funds through bribery.

Embezzlement of funding for vaccinations

Two cases of the embezzlement of financing for COVID-19 vaccines were identified in the three countries. In cases 13 and 14, this amounted to embezzlement totalling between 8.6 to 16.4 million USD. A range of techniques were employed, including false invoicing and purchasing of unneeded equipment for inflated prices. Historically, there have been multiple cases of embezzlement of donor and emergency funds over the years in the three countries, and given the amount of COVID-19 emergency funding, it is not too surprising to see this again.

Several organisations have warned that large proportions of emergency funding from International Financing Institutions appear to be a) unaccounted for and b) have had little demonstrable impact. In Bangladesh, Transparency International Bangladesh (TIB) criticised the lack of transparency in the procurement of the COVID-19 vaccines in a research report published in April 2022^{xxviii}, finding inconsistencies in the amount spent on purchase of vaccines and the overall vaccine rollout.

According to the Ministry of Health, 200,000 million Bangladeshi Taka (2.3 billion USD) was spent on procuring vaccines. However, in checking all currently publicly available data on the prices paid for vaccines, TIB could only find expenditure of BDT 112,544 million (1.3 billion USD). Similarly, the Minister of Health has stated that the total cost for the entire vaccination programme – costs for procurement of the vaccines as well as the costs for their distribution – is BDT 400,000 million (4.6 billion USD), whilst TIB estimates costs between BDT 129,930 (1.5 billion USD) and 167,210 million (1.9 billion USD), less than half of the reported cost^{xxix}. Questions have been raised as to the discrepancies, and what the money has been spent on. Thus, financial embezzlement represents a serious concern, with multiple corruption risks at all points in the supply chain from the international to local level.

ACTIONABLE LEARNINGS

The above findings, combined with TI Global Health's experience and research into good practice, enable us to identify several actionable learnings. We have split them into three different categories which are defined by the actors that they are applicable to:

1. Accountability-driven non-governmental organizations implementing at country level
2. International community including donors and international financing institutions
3. Accountability research community

Despite this grouping, it is important to note that the role of each of these will overlap. Funders and IFI's particularly have a role in identifying priority research and national implementation areas.

For accountability-driven non-governmental organizations implementing at country level

Geographic bribery hotspots should be continually identified and prioritized in terms of monitoring and accountability interventions

The anti-corruption community has often used the term hotspots as a way of explaining localized and concentrated risk of corruption^{xxx}. These can be of geographical nature as identified in our research but can also be applied to a range of different variables such as administrative processes or demographics. The advantage of identifying hotspots is that it can narrow down the scope of potential interventions by enabling to pool resources strategically, so that most go where the biggest problems are and thereby have the biggest impact for the money.

Organizations with monitoring and accountability expertise such as Transparency International would particularly benefit from such an approach. One of the most cited disadvantages to community monitoring is that it is very hard and expensive to set up mechanisms broadly across countries, and instead actors must choose where to intervene.

Therefore, it is prudent for these NGOs to work to identify these hotspots using regular surveys, and target interventions at these hotspots to directly tackle the issue of bribery. Approaches could include working with clinics that have a particularly bad bribery records to improve systems, or to set up strategic whistleblowing systems within high-risk facilities. At a subnational level NGOs, should consider working with subnational governments to improve their monitoring systems and build resilience.

Take a strategic perspective on community monitoring which includes special consideration for the differing risk dynamics of the COVID-19 context

Our experience as well as prevailing theory suggests that community monitoring can be an effective deterrent to corruption while increasing equity and efficiency. Such interventions are most successful when they have a clear goal which is relevant to the community and directly targets a high-risk area. COVID-19 has stretched governmental capacity leading to increased risk. As such, community monitoring approaches remain a critical aspect of ensuring accountability and equity. To have the most impact, NGOs should assess different aspects of the vaccine value chain, including supply chain, emergency funding and policy choices, to identify where monitoring approaches are most likely to have the biggest impact. Two areas may be particularly suited to community monitoring:

1. Our research identified several problems with governance of vaccine certificate delivery – with issues of diversion, bribery, and fraud, which undermine the entire vaccination progress and risk pockets of high transmission. To reduce fraud, governments have been switching from paper-based to digital vaccination certificates which are generally more difficult to falsify, as they contain a QR code and digital signature, but still not immune against falsification^{xxxi}. Their introduction also poses technological challenges, for instance in Uganda, where the data of 6.5 million people who had received at least one dose of the vaccine had not yet been uploaded into the Ministry of Health’s data system by the point of switching to digital certificates^{xxxii}. Similar observations were reported by the TI Chapter in Zambia. Where the digital certificate is required for travel or access to services, this could create another incentive for corrupt fraud, as purchasing falsified certificates will be the only way to gain access until the data gaps have been closed.

Here, depending on the exact system and data availability, NGOs could monitor stock levels along the supply chain, assist communities in identifying fraudulent certificates, or identify inconsistencies between official and real statistics on quantities deployed. Such approaches would be relatively easy to implement at the community level without in-depth technical experience.

2. Our evidence aligns with prevailing corruption theory in that when there are large influxes of emergency funding and heightened spending, there is likely a greater embezzlement risk. Yet audits can take a long time, often needing several technical steps, and can be politically motivated^{xxxiii}, meaning that there can be little accountability while corruption is taking place rather than retrospectively. As the example of TI Bangladesh demonstrates^{xxxiv}, NGOs can take the first step by matching spend with allocation and impact datasets where available. Through this, inconsistencies can be brought to the fore and governments can be forced to respond.
3. Another option is to empower civil society and community-based organisations to monitor the vaccination progress. They can help ensure that no stock is being diverted during delivery and that the vaccine is administered to those who need it most. As monitoring in the case of the vaccine rollout mainly consists of checking the numbers of vaccines, equipment and vaccination cards delivered and distributed against the numbers expected, as well as assessing the demand on-site (e.g. how many residents of which groups, including at-risk groups, need a vaccine), those who have worked on conducting health surveys or censuses might be valuable partners in this process. This has for example proven successful in the distribution of tuberculosis and HIV/AIDS treatment in Malawi^{xxxv}.

Implement and strengthen awareness raising campaigns that explain whistleblowing mechanisms as well as key information on the vaccine process.

Civil society groups are important cornerstones in ensuring the success of the vaccine rollout. Not only can they raise awareness amongst community members about their rights and entitlements concerning the vaccine, but they can also provide important feedback mechanisms such as toll-free hotlines or other whistle-blower platforms through which corruption can be reported^{xxxvi}. Despite this, our evidence suggests that many citizens in the three countries either do not know how to report occurrences of corruption, or fear reprisals if they do. As such, awareness campaigns should be further funded and implemented, especially in high-risk hotspots, to expand knowledge of reporting hotlines. These should:

- Emphasise the tenet of anonymity for all reporters
- Explain the process as simple and accessible as possible
- Where possible, be embedded into broader vaccine uptake awareness campaigns in order to guard against communication fatigue and save resources
- Provide a simple overview of the correct vaccination process, so citizens can understand where things have gone wrong
- Advocate for a gender-sensitive approach to corruption reporting and whistleblowing
- Consider the most appropriate form of communication. Chapter reports suggest successful approaches often happen in collaboration with community leaders and duty bearers and in the context of Uganda and Zambia, through the radio.
- Communicate outcomes of reports to build trust in reporting systems

Several opportunities for strengthened community oversight of fake vaccines

One proposed reason for the presence of substandard and falsified vaccines is weak oversight of the distribution chain. Cissy Kagaba, former Executive Director of Anti-Corruption Coalition Uganda, argues that “government should also work very closely with local Civil Society Organisations to monitor vaccination activities”^{xxxvii}. Such CSO oversight mechanisms have been proven in some contexts to be a valuable, inexpensive way to fill the accountability gap when government is stretched, enabling the reporting of inconsistencies that may otherwise be missed or ignored.

In this context, such oversight mechanisms can be used to track supply levels to ensure that vaccines are not diverted, diluted or replaced – an approach currently being piloted in Uganda and Zambia by TI. However, each of the cases presented show that the fraudulent provision was identifiable, whether due to inconsistent packaging or suspicious context, by those who know what to look for raises the possibility of more direct and targeted communal oversight of supply chains.

WHO and GAVI provide guidance that could be adapted to COVID-19 vaccines (see Annex 3). TI plans to adapt this guidance into simple communication messaging that will be used as part of our outreach activities alongside guidance on reporting issues via TI hotlines. Contextually appropriate forms of communication are obviously required. In Uganda and Zambia, TI has found consistent and repetitive radio jingles to be the most effective means of raising general

awareness whilst providing such resources to community leaders and village health groups can also be effective.

Another approach that could prove effective is to train community monitors to go to vaccination sites and check for suspicious packaging or unfit for purpose environments or facilities. This could allow for a direct data collection on prevalence of and reporting of substandard and falsified vaccines. However, information on where they are most likely to occur is very limited, and a large number of monitors will be required. TI will continue to assess the viability of this approach as we collect new data and, if possible, will integrate this with other types of physical monitoring.

For donors and international financing institutions and national governments

Role for IFI's and donors in guarding against financial embezzlement

In total, all three focus countries have received huge amounts of support funding, with over \$1 billion USD in emergency funding from the IMF alone going to the three countries to support tackling COVID-19. Given the indications of missing finances and cases of embezzlement, IFI's should work to ensure that funding is used properly. Anti-corruption clauses do exist in these funding agreements, but these are inconsistently applied across countries and not monitored consistently for adherence outside of occasional audits. IFI's should therefore commit to including two approaches within their agreements:

1. Work to include minimum anti-corruption and transparency standards in key spending arenas for all funding agreements. These standards should include:
 - a. The publication of all contracts over a reasonable threshold and accompanying metadata including at a minimum, data points on beneficial ownership, contract value, key dates of the process, name of organization receiving money & procedure type.
 - b. At a minimum, access and funding for independent auditors for audits to be carried out within a reasonable timeframe. Ideally, however, IFIs include the requirement that oversight bodies identify red flags related to COVID-19 vaccine distribution in real time, with functions to include the "capability to monitor the emergency disbursements of funds, the purchase of vaccines, and the distribution of vaccines and related processes"^{xxxviii}.
 - c. The tagging of all expenditure that is part of the IFI funding, from international disbursement to spending, to allow the public to track where money is actually going.
 - d. Formal engagement of CSOs to track adherence of other standards and to ensure integrity
2. Should systems not be capable of implementing such standards, then IFI's should note this in their agreements along with evidence and instead include provisions that:
 - a. Work to strengthen said systems. For example, a World Bank recommendation includes increasing the capacities of supreme audit agencies to use ICTs, so that

they can access government data systems remotely so that they can continue their work, such as real-time rolling audits, from home if need be.

- b. Utilize and fund where possible neutral third parties, including international and national NGOs, to independently monitor high risk areas and thereby mitigate the accountability gap.

Whilst funding from donors is less likely to be spent by governmental entities, they still have a vital role in ensuring their financing is safeguarded. During the Ebola crisis, widespread fraud undermined the humanitarian efforts of international organizations to stop the spread of the disease. Knowing this, donors should put in place full-time audits to monitor large-scale humanitarian funding. This has already been done by the the International Federation of Red Cross and Red Crescent Societies (IFRC). For smaller projects, a full-time auditor could be responsible for a pool of projects, or at a minimum, donor agencies should earmark funding for ex-post audits.

Donors and IFIs can improve supply chain resilience to diversion, both for vaccines and beyond

Development of open vaccine distribution tracking mechanisms as well as open data can be used to counter diversion of key medical products by mapping and publishing where and how many vaccines and certificates are meant to be at any given time. Communities, patient rights groups and healthcare facilities can help provide updates on the logistics, storage and administration of the vaccine.

Such systems could be embedded into or use existing systems such as health management information systems or DHIS2, which already has available a plugin for COVAX to keep track of vaccination activities and perform daily stock management. This investment infrastructure has the potential to build greater accountability into the broader health system. Community-based organisations as well as oversight agencies can use it not only as a monitoring system, but also to advocate for greater transparency in the distribution of the vaccine.

Lastly, diversion can also be prevented by investing more in security systems. These include tracking systems for vaccines that are being transported to distribution facilities, using GPS and other geo-tagging systems, unique identifiers such as two-dimension barcodes, and anti-tampering devices^{xxxix} that track whether a delivery has been opened or tampered with during distribution. Such anti-tampering devices have been required for most prescribed and over-the-counter drugs in the European Union since 2019^{xl}. Blockchain technology also has a big potential to reduce diversion in the supply chain^{xli}. These technologies could help to make monitoring systems more accurate and efficient.

For the accountability research community

Further research is needed to answer questions not covered by our data collection approach

We designed our data collection system to quickly obtain current information across multiple manifestations of corruption in order to swiftly identify high risk areas. The principal driver in this process was to inform programme design and implementation. However, this approach is limited in going into detail, for example around drivers for corruption and more complex structures within the corruption nexus. Therefore, more in-depth and targeted research into evidence gaps identified above is needed, including:

- **Need for better understanding of HR structures at vaccine facilities.** There is an observed lack of human capacity at vaccination sites which could generate discretion^{xliii}_{FOBJ}. Given that this is theoretically a key driver for bribery, this should be further researched and/or monitored. Proposed approaches could include that when cases of bribery are reported, follow-up questions should elicit responses on HR structures when the solicitation occurred, for example, asking whether supervisors were in the room. Additionally, the viability of surveys and interviews of vaccine providers should be assessed. Whilst understaffing is an issue that may be difficult to solve, insights from the above approaches could help identify inconsistencies in oversight processes that could be mitigated without the need for more human resource capacity.
- **Need for better understanding of what causes geographical bribery hotspots in emergency environments.** Whilst the work we have done has shown the existence of these hotspots, it is uncertain why they exist. Common explanations for increased bribery include low or inconsistent pay, stretched human capacity, and different social norms. Further research could investigate the causal relationship between geographical variances of bribery rates and these factors.
- **Lack of evidence on the relationship between different aspects of demographics and bribery risk.** Our research has argued that people who live in bribery hotspots and those that are poor are likely to be restricted in their access to vaccines by bribes. Yet there is likely other demographic information which will correlate with restricted access. Further research could investigate whether aspects such as e.g. religion, political views or age are likely to correlate with bribery risk. This could serve as the basis for further investigation into drivers and therefore provide a route for resilience to corruption.
- **Whilst our research has shown that fraud, diversion and embezzlement are occurring, it does not provide information on the prevalence of such acts or what the overall impact they have on access is.** Survey approaches will likely prove insufficient in generating such data because of the clandestine nature of such acts and thus investigative audits or perception research may be better routes.
- **Whilst both our assessments and online literature considered sextortion and nepotism to be areas of high risk, no direct incidents were identified through our data collection process.** This does not necessarily mean that they are not an issue, but rather that our methodology has not been suited for capturing data on them. Other data collection techniques, such as targeted surveys for certain segments of the population, or key informant interviews should be conducted to get an idea of their prevalence and impact.

ANNEX 1. LIST OF CASES

Case No	Title	Date	Case Study	Corruption Categories	Country
1	TI Uganda Case Report - Bribes demanded for vaccine at health centre	N/A	In Kiwangala Health centre IV, Lwengo district, Transparency International Uganda became aware through the MFA supported whistle-blower hotline that vaccine seekers were asked to pay 1,000 and 2,000 Ugandan Shillings (0.28 to 0.56 USD) for their first and second vaccine respectively by one specific health worker. This is despite Ugandan policy that the entire process should remain free of charge.	Bribery	Uganda
2	Bribery prevents vaccine seekers from getting their dose	10th August 2021	In Bangladesh, the news outlet the Daily Star reported that at Radda MCH-FP Centre in Mirpur-10 crowds were unable to access vaccinations without paying 200-300 Bangladeshi Taka (equals around 2.30 - 3.45 USD). ^{xliii}	Bribery	Bangladesh
3	Bribes demanded for vaccine administration	10th August 2021	Similarly, at Chattogram City Corporation Hospital, a correspondent observed that 10 vaccine seekers alleged that a bribe of 150 Bangladeshi Taka (1,73 USD) was needed to get the vaccine. ^{xliv}	Bribery	Bangladesh
4	Pharmacy demands bribe for wrongly stored vaccine	26th August 2021	The Daily Star reported that at least 3000 people were asked for a minimum of 500 Bangladeshi Taka (5.76 USD) to be vaccinated at the 'Poor Family Service Agency' which may have involved a paramedic and village doctor. Those vaccinated are also likely to have not obtained the full vaccinal immune protection, as the pharmacy did not store the vaccine correctly. ^{xlv}	Bribery, Corrupt Fraud	Bangladesh
5	At least 800 people receive falsified vaccine against payment	12 th august 2021	In the Kampala Metropolitan Area, the Daily Monitor reported that at least 800 people received fake vaccines between May and June – potentially being injected with just water. State house detectives arrested two nurses who are accused of charging people between	Bribery, Corrupt Fraud	Uganda

			100,00 and 200,000 Uganda Shillings (27.77 to 55.53 USD) for each xlvi ^{xlvii}		
6	Falsified Covishield doses identified in Uganda and India	1st September 2021	Falsified Covishield vaccines have been identified in Uganda (as well as India and Myanmar) by the Serum Institute of India – the genuine manufacturer. This was reported to the manufacturer by patients in country due to the following false information on packaging: a. Batch 4121Z040 - the expiry date (10.08.2021) on this product is falsified (Uganda) b. COVISHIELD 2ml - the genuine manufacturer does not produce COVISHIELD in 2ml (4 doses). (India) ^{xlviii} c. Batch 4126Z079 - the batch number on this product is falsified and the product name: COVISHELD is not the correct spelling (Myanmar) ^{xlix}	Corrupt Fraud	Uganda
7	Health workers steal vaccination cards and sell them to unvaccinated buyers	10th January 2022	Three employees at a health facility in Hoima were arrested after being suspected to have sold falsified Covid-19 vaccination cards. The employees stole the vaccination cards from the health centre they were working at and sold them to unvaccinated buyers in the Hoima district for 50,000 Ugandan Shillings (13.90 USD) by inserting their contact details and made-up vaccination dates. The introduction of increased entrance regulations that can prevent unvaccinated from entering their workplace had motivated the buyers to pay for a falsified card. To fight the problem of fraud, the Ministry of Health is now replacing the paper-based cards with electronic vaccination certificates, which require a data entry in the Ministry's portal before it can be issued ^l	Corrupt Fraud	Uganda
8	Doctor sells falsified vaccination card for bribe	25th June 2021	The doctor in charge of administering the COVID-19 vaccinations at a health centre in Central Uganda was caught by the police for selling a falsified vaccination card to a patient without vaccinating him. It was sold in exchange for a bribe of 80,000 Ugandan Shillings (22.24 USD). Upon his arrest, the Resident District Commissioner ^{liii}	Bribery, Corrupt Fraud	Uganda
9	Undercover investigation	24th May 2021	An undercover investigation by Ugandan news outlet New Vision reported that at Kiswa Health Centre health workers would sell	Bribery	Uganda

	reveals bribery in healthcare centre		vaccination forms and cards for 20,000 to 50,000 Ugandan Shillings (5.56 to 13.90 USD) each. This was only offered to certain vaccine seekers. According to the report the health centre, which vaccinates 100 people a day, gave certain individuals preferential treatment who “do not qualify for the priority list of those supposed to be vaccinated” with one group having been directed to this specific site by their employer. ^{liii}		
10	Fraudsters sell fake vaccine against bribe	4th August 2021	Two Lusaka residents have been to court for obtaining K2,650 (155.29 USD) for injecting an unsuspecting citizen with a fake COVID-19 vaccine. These residents were not official health workers, but falsely presented themselves as such. ^{liv}	Bribery, Corrupt Fraud	Zambia
11	Express vaccination date per SMS in exchange for bribe: Criminal network caught in Dhaka	21st September 2021	In Bangladesh, those interested in receiving the vaccine receive their vaccination date per SMS after registering on the web portal 'Surokkha'. A criminal network of four men took exploited this system by offering vaccine seekers in the capital Dhaka to send them an imminent vaccination date per SMS in exchange for a bribe of 2,500 to 5,000 Bangladeshi Taka (28.78 to 57 ^{lv} USD). Over 200 vaccine seekers fell for the offer before the men were reported to the police and arrested by the Rapid Action Bataillon. ^{lvi}	Corrupt Fraud	Bangladesh
12	Network of hospital staff sold falsified vaccination certificate in exchange for bribe	20th November 2021	A network of hospital staff gave out falsified vaccination cards to willing buyers for a bribe of 5,000 to 6,000 Bangladeshi Taka (57.56 to 69.07 USD). Buyers could obtain the vaccination card in exchange for the bribe without getting vaccinated. 13 members of the network were arrested by the Dhaka Metropolitan Detective Police in November. ^{lvii}	Bribery, Corrupt Fraud	Bangladesh
13	Allegations of embezzlement of money for development of Ugandan Covid-19 vaccine	17th Nov 2021	Between 31 billion and 59 billion Ugandan Shillings (8.6 to 16.4 million USD) that were meant for an initiative to develop a Covid-19 ^{lviii} to the Inspectorate of Government (IGG) in October 2021 now claims that PRESIDE these funds had been misappropriated for the purchase of unnecessary equipment and that large parts of the funding had not been accounted for. The letter also mentions	Embezzlement and Diversion	Uganda

			irregularities in the recruitment of the staff of PRESIDE. The Minister for Science, Technology and Innovation, Dr Monica Musenero, who had requested the money, is at centre stage of these allegations and is now being investigated against by a five-person committee selected by the Deputy Speaker of Parliament. ^{[obj]lix}		
14	Public money embezzled for vaccinations that were never conducted	11th September 2021	A staff member at the union council in the Natore district in northern rural Bangladesh was found guilty of embezzlement after falsely charging the council for conducting vaccinations against COVID-19. He withdrew money and charged the council bills to cover the costs for staff, equipment, logistics for the vaccination and the vaccine itself despite the union council not having administered one single vaccination. The bills amounted to 1,649,000 Bangladeshi Taka, which equals around 18,840 USD. ^{[obj]lxi}	Embezzlement and Diversion	Bangladesh
15	Vaccines and vaccination cards diverted from healthcare centre	14th June 2021	Over 800 doses of the AstraZeneca vaccine were allegedly stolen from a healthcare centre alongside over 1000 vaccination cards, medical ^{lxii} and consent forms. They were then sold to vaccine seekers in two nearby pharmacies. ^{lxiii}	Embezzlement and Diversion, Bribery	Uganda
16	Health worker diverts vaccine for private profit	8th June 2021	A medical laboratory assistant in Entebbe has been suspected of stealing AstraZeneca vaccines from her workplace, a health clinic in a Kampala suburb, and privately selling them. ^{lxiv}	Embezzlement and Diversion, Bribery	Uganda
17	Vaccination cards sold to unvaccinated buyers	15th October 2021	In the Lira district, several reports have been registered by the police of vaccination cards being sold for bribes of 10,000 to 100,000 Ugandan Shillings (2.78 to 27.80 USD) to unvaccinated people. Amongst the most frequent buyers are teachers as well as people opposing the vaccine. Reports have been recorded from the Lira Regional Referral Hospital but also outside. ^{lxv}	Bribery, Corrupt Fraud	Uganda

ANNEX 2. CORRUPTION TYPOLOGY

Embezzlement and diversion	<p>Embezzlement is the fraudulent appropriation, diversion or theft of resources, whether public or private, which can include medicines, vaccines, property or money by a person to whom it has been entrusted, for example, embezzlement of public funds by a public officer. It is usually committed by otherwise law-abiding people during the course of their employment and it occurs at all levels of government, from the stealing of petty cash to a high-level politician stealing large sums of public capital. The mechanisms by which national resources are channelled abroad as capital flight include embezzlement of borrowed, donated or aid funds, misappropriation of revenues from state-owned enterprises, and smuggling of natural resources.</p>
Bribery	<p>Bribery is the illegal, unethical or illicit offering, promising, giving, accepting or soliciting of resources for the purposes of private gain. Said resources can include money, gifts, loans, fees, rewards or other advantages (taxes, services, donations, favours etc.). There are many different types of bribery: A kickback is a form of negotiated bribery where there is collusion between agents of the two parties. The most common form of kickback involves a vendor submitting a fraudulent or inflated invoice to an employee of the victim company assisting in securing payment. For his or her assistance in securing payment, the individual receives some sort of payment. When a person offers, promises, or gives a bribe, it is called 'active bribery'. Examples of active bribery include payments in order to win a public contract or for the award of licences. Passive bribery is when a person requests, receives, or accepts a bribe. Examples of passive bribery include when fees are demanded from suppliers by procurement officials to facilitate their winning of a contract, or when recruiters ask for payment in order to appoint job seekers that otherwise may not have been selected. The paying of bribes by health seekers is widespread in many countries. Bribery as discussed here is "a direct contribution, which is made in addition to any contribution determined by the terms of entitlement, in cash or in-kind, by patients or others acting on their behalf, to healthcare providers for services that the patients are entitled to"^{lxvi} (Gaal et al. 2006, see also Chereches et al. 2013). These direct contributions, generally speaking, constitute bribery if they are made before treatment, if they are actively solicited – or extorted – by the provider, and if they involve cash or expensive items^{lxvii}.</p>
Corrupt fraud	<p>An act that involves someone with entrusted power using deceit, trickery or false pretenses in order to gain an unfair or illegal advantage (financial, political or otherwise). Corrupt fraud includes the falsification of records, data manipulation, scams designed to deceive people into giving resources or money to the perpetrator, deliberate falsification, concealment, destruction or use of falsified documentation used or intended for use for a normal business purpose, or the improper use of information or position for personal financial benefit.</p>

ANNEX 3. GAVI AND WHO IDENTIFYING SUSPICIOUS MEDICINES GUIDANCE

GAVI "6 P's on identifying suspicious contexts"

- Place: Do not buy medicines from unknown websites or in a marketplace, for any reason. Buy medicines only from licensed suppliers whose authenticity is verifiable.
- Prescriptions: Only buy medicine that has been prescribed by your doctor or healthcare professional.
- Promises: Watch out for false promises like "cures all types" of a major illness, "money-back guarantee", "no risk" or "limited supply – buy in advance".
- Price: Compare the price with products you usually buy. If it is much cheaper, it is likely to be a fake.
- Privacy: Interpol says the trade in fake medical products has also been linked to credit card fraud and identity theft. Do not reveal any personal information beyond appropriate medical details.
- Product: A medicine is fake if: it contains too much, too little or any different ingredients; claims to have different properties or side-effects; is not correctly labelled or not labelled at all; has an out-of-date or missing expiry date; does not contain information on how to store the medicine; the packaging looks poorly made or looks tampered with; there are spelling or grammatical errors on the packaging or instructions.

Identifying suspicious medicines (WHO)

- Examining the packaging for condition, spelling mistakes or grammatical errors;
- Checking the manufacture and expiry dates and ensuring any details on the outer packaging match the dates shown on the inner packaging;
- Ensuring the medicine looks correct, is not discoloured, degraded or has an unusual smell;
- Discussing with your pharmacist, doctor or other healthcare professional as soon as possible if you suspect the product is not working properly or you have suffered an adverse reaction; and
- Reporting suspicious medical products to your National Medicines Regulatory Authority.

ANNEX 4. LITERATURE REVIEW SEARCH STRINGS

TI-GH conducted a non-systematic search of academic, scientific and grey literature in the fields of medical and political sciences. The purpose was to seek out literature on corruption in the rollout of the COVID-19 vaccine in the three focus countries, Bangladesh, Uganda and Zambia, that was published between 1st January 2021 and 31st March 2022. Data was collected through manual searches with the search engines Google and Google Scholar, using the following search strings:

1. "corruption" AND "Bangladesh" AND "Covid" AND (vaccine OR vaccination)
2. "fraud" AND "Bangladesh" AND "Covid" AND (vaccine OR vaccination)
3. "theft" AND "Bangladesh" AND "Covid" AND (vaccine OR vaccination)
4. "embezzlement" AND "Bangladesh" AND "Covid" AND (vaccine OR vaccination)
5. "corruption" AND "Uganda" AND "Covid" AND (vaccine OR vaccination)
6. "fraud" AND "Uganda" AND "Covid" AND (vaccine OR vaccination)
7. "theft" AND "Uganda" AND "Covid" AND (vaccine OR vaccination)
8. "embezzlement" AND "Uganda" AND "Covid" AND (vaccine OR vaccination)
9. "corruption" AND "Zambia" AND "Covid" AND (vaccine OR vaccination)
10. "fraud" AND "Zambia" AND "Covid" AND (vaccine OR vaccination)
11. "theft" AND "Zambia" AND "Covid" AND (vaccine OR vaccination)
12. "embezzlement" AND "Zambia" AND "Covid" AND (vaccine OR vaccination)

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