

Article

Mapping the Use of Open Source Research in UN Human Rights Investigations

Daragh Murray, Yvonne McDermott , and K. Alexa Koenig

Abstract

Open source information, particularly digital open source information that is publicly available on the internet, plays an increasingly central role in the landscape of human rights investigations. This article provides a thorough analysis of how open source information is used in practice by UN human rights fact-finding missions, commissions of inquiry and other official human rights investigations. Combining data from semi-structured interviews carried out with investigators with specific experience in open source human rights investigations with a review of reports and other primary and secondary sources, it examines the utility of open source information to UN human rights investigative bodies. It posits that open source research can offer tremendous benefits in planning investigations, supplying lead evidence, and providing direct evidence of violations, thereby overcoming some of the access barriers that investigators face, and potentially giving voice to a wider range of perspectives. On the other hand, this article argues that open source investigations should be approached with a clear eye to their challenges and possible pitfalls. These include the gaps of open source information and the potential to silence already-marginalized communities through open source investigations, as well as the resource-intensive nature of these investigations, the danger that open source information can affect witnesses' perceptions, and the risks posed by online disinformation. As open source research is likely to comprise an important component of the human rights investigator's toolbox in the future, this article argues in favour of the institutional buy-in, resourcing, and methodological rigour that it deserves.

Keywords: accountability; fact-finding; human rights investigations; human rights law; open source information; technology

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1. Introduction

Observers of the work of UN human rights fact-finding missions, commissions of inquiry and other official human rights investigations will be aware of the increased importance of open source information to identify, corroborate and verify accounts of human rights violations. For example, the Independent International Fact-Finding Mission on Venezuela set out a four-part methodology for collecting evidence that included a review of online open source information, along with the incorporation of confidential interviews, confidential documents, and a call for submission of evidence (UN Human Rights Council 2020a: para. 9). The Mission noted that open source information, which encompassed social media, blogs, reports and press cuttings, was used for essential investigative tasks, including ‘to identify and verify incidents and actors involved (victims and perpetrators) and to corroborate and help contextualize information gathered from direct sources through confidential documentation and interviews’ (UN Human Rights Council 2020a: para. 10).

The fact-finding mission on Venezuela followed the lead of recent UN-mandated missions in identifying open source information as an important investigative resource. For example, the Commission of Inquiry on the protests in the Occupied Palestinian Territory reviewed and verified photos and videos from social media platforms in reaching its findings (UN Human Rights Council 2019a: para. 34). The Group of Eminent Experts on Yemen used open source information to identify leads, assess the reliability or viability of other information sources, or as part of the corroboration process (UN Human Rights Council 2020b: para. 17). Social media materials were also central to the findings of the Fact-Finding Mission on Myanmar on hate speech (UN Human Rights Council 2018a: paras 86–7). The same mission made extensive use of satellite imagery, noting that a satellite image showed ‘new roads, large structures and a perimeter fence under construction, indicating the likely establishment of a new security force base’ (UN Human Rights Council 2018a: para. 1236). The June 2018 report of the Office of the High Commissioner for Human Rights (OHCHR) on Jammu and Kashmir relied extensively on material in the public domain, considering the access issues that restricted the Office’s human rights monitoring in the region (OHCHR 2018: paras 27–8).

Civil society and academia have recognized the challenges of, and opportunities for, fact-finding in a digital age, with initiatives designed to identify best practices, minimum standards, and general guidelines relating to the preservation and use of open source information. Some of these initiatives have been focused on ensuring the admissibility of such evidence in legal accountability processes (International Nuremberg Principles Academy 2021; Kalshoven Gieskes Forum 2021; OSR4Rights, GLAN and Bellingcat 2021). Others, such as the Berkeley Protocol on Digital Open Source Investigations (hereafter, ‘Berkeley Protocol’: Human Rights Center and OHCHR 2020), seek to create a broader set of minimum standards for the collection, analysis, and preservation of digital open source information for human rights, international criminal law, and humanitarian investigations and documentation.

In light of the growing role of open source information in today’s investigatory landscape, it is important to take stock of the impact that this kind of material is having on human rights fact-finding. This article addresses both the potential utility of, and potential challenges associated with, open source information, before looking more directly at UN investigative bodies’ current engagement with digital open source information, and what the future might hold. Incorporating insights from twenty-three semi-structured interviews carried out with UN human rights investigators since 2018, in conjunction with a desk study of primary and secondary sources, this article examines perceptions regarding the role, or

potential role, of open source information by UN human rights investigative bodies. Interviewees were chosen due to their expertise in open source investigative methods and their participation in a recent UN human rights investigation (or in some cases, several such investigations), or their role within the UN human rights system more generally. We also interviewed three experienced investigators from large international NGOs with recent experience of open source methods, as a counterpoint to the experience of human rights investigators within the UN system. Interviewees had worked, *inter alia*, on investigations in Cameroon, Central African Republic, Gaza, Myanmar, North Korea, Syria, and Yemen.

Before presenting the key findings of this study, we define open source information and categorize the different forms of this information that may be used. Open source information is, at its most basic level, any information that is publicly available. Reference is often made to ‘OSINT’, or open source intelligence, defined as intelligence ‘[p]roduced from publicly available information that is collected, exploited, and disseminated in a timely manner to an appropriate audience for the purpose of addressing a specific intelligence requirement’. (US Government, National Open Source Enterprise 2006). Some authors (including ourselves) prefer to use the terms ‘open source information’ or ‘open source research’ in place of OSINT to decouple open source information from intelligence work (Fiorella 2021). The Berkeley Protocol on Digital Open Source Investigations defines *digital* open source information as ‘open source information on the internet, which can be accessed, for example, on public websites, internet databases, or social media platforms’ (Human Rights Center and OHCHR 2020: 6–7). Such evidence can be obtained through observation (that is, by navigating relevant websites and seeing what they include); purchase (for example, by paying a subscription or one-time fee for access to archives, newspaper or journal articles, or satellite imagery), or request (for example, through Freedom of Information requests or other processes).

When discussing open source information, interviewees referred to a wide spectrum of information, ranging from NGO reports and newspaper articles to court orders and police reports obtained through freedom of information requests to content posted on social media sites. This broad understanding of open source information as ‘information in the public domain’ is reflected in reports of human rights investigations. Examples include the OHCHR’s report on the Indian-Administered and Pakistan-Administered Kashmir, which noted that:

Information used in this report is available in the public domain, some of which was obtained by various parties in India through the Right to Information Act, and also reflects the findings of research and monitoring carried out by local, national and international nongovernmental organizations (NGOs) and human rights defenders. Wherever possible, OHCHR has used official documents and statements, such as Parliamentary questions, court orders, and police reports (OHCHR 2019: para. 47).

The OHCHR’s Venezuela report also highlighted that the Mission made full use of a wide range of open source information, including social media; blogs; reports; journalistic articles; and press releases, among other sources. The Mission evaluated the *prima facie* reliability of these sources by reviewing the content in the information provided as well as contextual information (UN Human Rights Council 2020a: para. 10).

However, different levels of reliability may attach to the different forms of open source evidence. For example, a user-generated video posted to social media which has been verified may bear more weight than a newspaper report of the same incident that features secondary accounts. Verification is the process through which the accuracy and validity of a piece of evidence is established. For a piece of video evidence, this process may include

geolocation, chronolocation, provenance checks, an analysis of the metadata of the video, and research into its source (McDermott, Koenig, and Murray 2021: 103–4).

Some international judges have expressed scepticism as to the evidentiary value of open source information (for example, *International Criminal Court* 2011: para. 78; *International Criminal Court* 2013: para. 29; Tarfusser 2021), and this was a sentiment that arose in a small number of our interviews, particularly among interviewees who had also worked at international criminal tribunals. However, on closer inspection, the type of open source information that both those interviewees and the judgments cited above showed reluctance towards tended to be secondary reports authored by non-governmental organizations, where the original source of the information was unidentified ‘anonymous hearsay’ (*International Criminal Court* 2011: para 78). This category of information can be distinguished from the first-person, user-generated content circulating on social media and other online spaces that is increasingly being mined for information related to human rights violations today.

As such, Fig. 1 attempts to distinguish between different types of open source information based on two key variables. The first variable asks, is the piece of information a primary source (that is, an immediate, first-hand account from an individual who had direct experience of the event in question) or a secondary source? Primary sources include online posts as well as remotely-sensed images and CCTV footage that are in the public domain, as the satellite or camera effectively acts as the direct witness in this context (Wästfelt 2005: 379–96). Second, is the information an individual piece of data, or an account based on an aggregation of data? While there is porosity between the categories—for example, a journalistic report may be a primary source (if an account of what the journalist directly observed) or a secondary source (if based on others’ accounts)—this distinction can be conceptually helpful. An NGO report will usually be a secondary account and an example of aggregated data, while a photograph taken by an eyewitness is a primary source and an

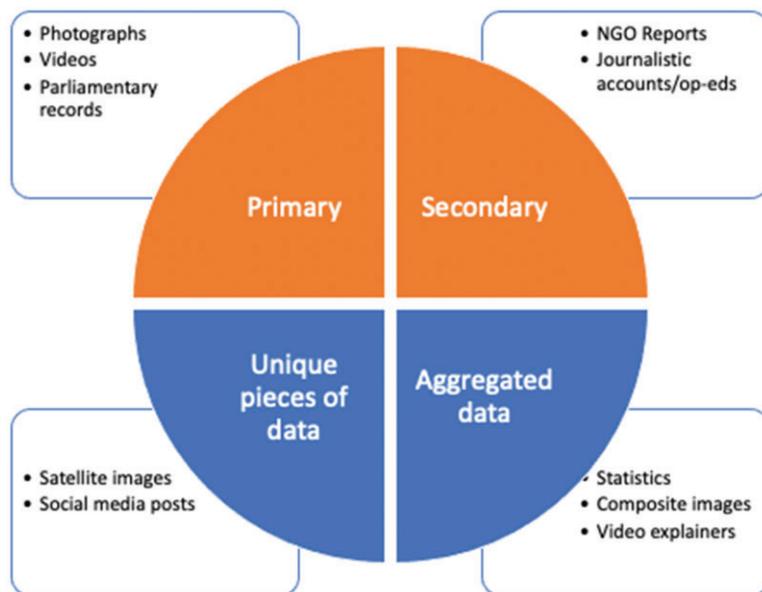


Figure 1. Types of open source information.

individual piece of evidence. The place of some categories of information in the diagram below will often depend on context. For example, an individual satellite image may be a unique primary piece of data, or satellite imagery might be used to create a composite map, thereby becoming a secondary aggregated data source.

In this article, we are particularly interested in the role of *user generated content*—that is, videos and images of human rights violations taken by eyewitnesses on the ground and shared online (Hamilton 2018). This type of evidence generally falls into the categories of primary sources and unique pieces of data in the typology above.

Part 2 analyses the benefits of digital open source information to human rights fact-finding, looking at: the potential role of open source information in developing an investigation plan; generating lead evidence; overcoming access restrictions; and amplifying marginalized voices. Part 3 then examines the potential challenges associated with open source investigations, including: cost and resource implications; issues of evidentiary weight; how open source information may influence witness perceptions; and the risks of disinformation. Part 4 examines the current use of open source evidence in UN-mandated human rights investigations, discussing institutional buy-in; resourcing issues; the provision of training, and the development of clear methodologies for conducting open source investigations.

2. Advantages of using open source information in human rights investigations

Interviewees were, on the whole, extremely positive about the potential of open source information to enhance human rights investigations. They noted that it can be beneficial in planning an investigation, particularly in giving a broad overview of the context to be investigated and gaining a range of perspectives that may be missed in investigations on the ground. Relatedly, investigators noted that open source information can generate leads that can be followed up in further investigations. Where investigators have been denied access to the region under investigation, open sources can provide invaluable insights into key incidents. Another identified advantage is the democratizing potential of open source investigations, in giving voice to a range of people who may not otherwise be easily reachable. Last, challenging the widespread perception that the main role of open source information is to corroborate testimonial accounts, many of our interviewees highlighted how open source evidence can constitute direct evidence of a violation. This section examines each of those perceived advantages in detail.

2.1 Developing an investigation plan

Interviewees almost unanimously agreed that the most significant perceived added value of open source information during the early stages of an investigation was in developing an informed overview of the situation under examination. This overview could then be used to generate a more effective investigation plan. One UN investigator, with years of experience across numerous human rights investigations, stated:

Open sources are extremely important, you have to plan your investigation: identify gaps, identify bias, identify what has been well documented. It allows you to plan your investigation properly. It's always the first thing I do (Interviewee M).

The belief that using open source information at the early stages of an investigation—in conjunction with traditional investigative techniques—facilitates the development of a more

effective investigation plan was echoed by other interviewees, one of whom, investigating human rights violations in Syria, succinctly summarized this sentiment: ‘we used open source[s] to give us an idea of where we should be focusing’ (Interviewee U). Importantly, as discussed further in section 2.4 below, drawing on open source materials may lead to the inclusion of more diverse voices and perspectives than may otherwise be possible—especially if used as a complement to more traditional investigative methods. This in turn may facilitate the development of an investigation plan that more accurately reflects the true extent of the human rights situation in the area under examination. For example, Orentlicher has noted that:

human rights investigators seek to avoid selection procedures that produce a skewed picture of overall patterns of violations in a country. When possible . . . [they] draw upon a broad range of sources to help identify potential witnesses. Input from multiple sources helps minimize distortions that might be built into any particular source’s contribution (Orentlicher 1990: 110).

In traditional investigations, witnesses are typically identified through known interlocutors or existing networks or are drawn from key actors in the area. While these actors, some of whom may have particularly relevant insight either as experts or as representatives of particular communities, are important sources of information, the use of open source information has the potential to add a more democratic element by bypassing traditional gatekeepers and enabling ‘ordinary people to participate in human rights monitoring’ (UN Human Rights Council 2015a: para. 39), a point developed further in section 2.4 below. Drawing more expansively from the experience of online contributors may provide important grassroots voices for the overall picture being compiled by investigators. This may help to address a problem identified by Alston and Gillespie with respect to traditional investigative approaches, which includes reliance on a (necessarily) limited number of witness interviews:

International human rights fact-finding currently relies heavily on witness testimony, usually gathered through lengthy in-person interviews by experienced investigators and advocates. International fact-finders spend weeks at a time investigating incidents and searching for witnesses, sometimes relying on trusted organizations, media accounts, or word of mouth for contacts . . . And fact-finding can be impeded or sometimes rendered impossible where investigators are unable to meet, whether for security reasons or because of other obstacles to access, with potential witnesses or examine the sites of alleged abuse. In such cases, serious abuses, including massacres, may be unknown to outsiders for months or longer (Alston and Gillespie 2012: 1110).

Open source information can significantly increase the number of perspectives that an investigative team can take into account in planning their investigation—without the need for initial resource-intensive in-person interviews—and a plurality of voices can help overcome limitations relating to access to a narrower range of witnesses. This ability to scale up the quantity of sources, and to do so in a time and resource effective manner, was noted by one interviewee, an experienced UN human rights investigator:

I can’t think of a way of doing interviews with enough people, given the resources and time, to collect the type of information to get the precision that you could from sweeping social media platforms (Interviewee Q).

Another interviewee noted, in the context of their investigations on Syria, that using open source information in this way also ‘provides a sense of how much information is out

there' (Interviewee T), indicating whether there may be sufficient evidence to support the investigation of particular incidents. The potential for open source information to inform investigative priorities, in circumstances where physical access may not be available or may be quite limited, has also been raised in relation to International Criminal Court (ICC) investigations, where access issues have been well-documented (Koenig et al 2018: 682).

A number of interviewees also discussed the added value of open source materials in developing a contextual analysis of alleged human rights abuses. For instance, those working for early warning or other monitoring bodies described 'context analysis ... as the principal added value of open source research' (Interviewee T). Similarly, the timeliness of open source information may provide a level of insight and granularity that would otherwise be impossible. By examining the timestamps of relevant social media posts, investigators can place information in a rough chronological order and can assess whether a witness's account is corroborated by information on the incident that can be gleaned from digital open sources.

2.2 Generating lead evidence

An overwhelming majority of interviewees said that another added value of open source research—in addition to mapping and investigation planning—was the generation of lead evidence. Lead evidence is information that does not help to prove a fact at issue in a case, but which provides concrete avenues for further inquiry—for example, by leading investigators to additional witnesses, or locations that may contain physical evidence. One interviewee, with experience across a wide range of UN human rights investigations, went so far as to reflect that 'the principal use of open source to date has been to provide leads' (Interviewee A). For example, social media posts may indicate the presence of a particular type or pattern of violations, such as sexual violence (for example, using coded language) (Koenig and Egan 2021), while incident footage posted to social media may be used to identify specific witnesses for interview. Social media can also be beneficial in revealing individuals' networks—potentially even showing linkages between perpetrators and commanders, or between co-perpetrators (International Criminal Court 2015). Reinforcing the point made previously as to the potentially increased diversity associated with open sources, one interviewee, working on Yemen, stated simply that open sources provide 'leads that you wouldn't otherwise get' (Interviewee V).

Several interviewees pointed to the value of open source material to establish patterns of violations. This observation speaks to a rich seam of literature on the impact of Big Data on our ways of knowing about the world. As boyd and Crawford noted, Big Data offers:

a profound change at the levels of epistemology and ethics. Big Data reframes key questions about the constitution of knowledge, the processes of research, how we should engage with information, and the nature and the categorization of reality ... Big Data stakes out new terrains of objects, methods of knowing, and definitions of social life (boyd and Crawford 2012).

Empiricist epistemology has posited that data-driven approaches can be expected to have a profound impact on science, because rather than formulating hypotheses from theory, analysts can mine large datasets to establish patterns and relationships (Anderson 2008; Prensky 2009). This literature, however, overlooks the fact that data are not neutral, and nor is it possible to analyse data from a purely objective standpoint

([Kitchin 2014](#); [D'Ignazio and Klein 2018](#)). In the context of international law, Johns has argued:

Sensing practice—or the work of trying to detect and verify certain worldly phenomena—that is carried out by international lawyers and international institutions creates uneven distributions of capacity and resources. It contributes to the creation and allocation of divergent ability to generate shareable sense-information. ([Johns 2017](#)).

The incompleteness of open source information, and the biases and gaps inherent to it, is a point to which we return in Section 3.1 below.

2.3 Overcoming access restrictions

The potential for open source information to overcome physical access restrictions—typically arising from security concerns or because permission to enter the area is denied by the relevant authorities—and to thereby facilitate investigations into otherwise off-limits areas is well known ([Abrahams and Murray 2020](#)). In this context, open source information has the obvious benefit of facilitating a more comprehensive investigation than otherwise, and thus more accurately reflecting the overall human rights situation. Commenting on conflict zones where access is restricted due to the security situation, Costello has noted that ‘the importance of open source evidence has been elevated from supplementary to critical in establishing the events which took place’ ([Costello 2018](#): 269). Similar conclusions are applicable in relation to situations where authorities deny access. For example, Puttick notes that:

When protests in Tahrir square gained momentum in 2011, the Egyptian government tried hard to keep foreign journalists out. Instead, major Western media outlets turned to social media to gather information about developments on the ground, scouring Facebook, Twitter and YouTube for updates from protestors in the square ([Puttick 2017](#): 14–5).

Importantly, the ability to conduct remote investigations in otherwise inaccessible areas can also help pre-empt criticism from parties to the conflict, given that the inability to travel to an area may open ‘the mission’s report to criticism and accusations that its findings are one sided or based on incomplete information’ ([Puttick 2017](#): 9).

A particular benefit of open source information is the speed at which material relating to an incident may be posted online. One interviewee, working on human rights monitoring of a particular region, noted that this often surpassed traditional information networks, and that open source monitoring teams working remotely ‘could often “beat” local [on the ground] teams in knowing about emerging issues’ (Interviewee F; see also [Alston and Knuckey 2016](#): 13).

Traditionally, investigators have seen digital open source materials as primarily corroborative of testimonial, physical and hard copy documentary evidence. However, necessity can force a change in approach. Where investigators cannot gain physical access, increased reliance is likely to be placed on open sources. One interviewee, in the context of Myanmar, noted that there can be situations where you have to ‘rely heavily or solely upon open source materials which . . . arise out of not having direct access to the violation’ (Interviewee Q). The Office of the High Commissioner for Human Rights 2018 report into the situation in Jammu and Kashmir was a landmark for the organization in this regard: as investigators could not access the territory due to restrictions imposed by the government of India, this was the first OHCHR report to be based almost entirely on open source materials ([OHCHR 2018](#): 27–8).

Interviewees also highlighted a reliance on open source information in areas where physical access was curtailed, including Venezuela (UN Human Rights Council 2020a: para. 6), Nicaragua (UN Human Rights Council 2019b: para. 2), Yemen (UN Human Rights Council 2020b: para. 6), and South-East Turkey (OHCHR 2017: paras 4–7).

Satellite imagery can play a particularly important role where access is limited or fore-closed. Satellite imagery was perhaps most famously used to demonstrate the existence of prison camps in North Korea and a campaign of ethnic cleansing in Darfur, when physical access to those areas was impossible (Koettl, Murray and Dubberley 2020: 12). More recently, satellite imagery has played a key role in documenting clearing operations, burning, and the replacement of destroyed civilian homes with military structures in Myanmar (UN Human Rights Council 2019c: para. 84). In November 2021, the Independent Fact-Finding Mission on Libya identified, using satellite imagery, several sites of apparent soil disturbances, corroborating accounts of mass grave sites in the same region and timeframe (UN Human Rights Council 2021d: para. 80).

2.4 Amplifying marginalized voices

As discussed above, the use of open source materials may also enable more perspectives to be heard, and potentially amplify otherwise marginalized voices. A feature of open source research identified as particularly useful is that it may shift control of the narrative away from human rights professionals, journalists, or other perceived elites, and move it into the hands of those directly affected by violations. As noted by Hamilton: ‘[u]ser-generated evidence could “democratize” evidence collection by shifting the balance of control from outside professionals to local people’ (Hamilton 2018: 5). Land points out that this may mean that ‘[t]hose who were formerly the “subjects” of human rights investigations now have the potential to be agents in their own right’ (Land 2016: 399). Precisely this point was highlighted by one interviewee, working on Syria, who reported that open source information means you hear ‘not just what human rights organisations are saying, [you are able to] access voices you wouldn’t otherwise hear from’ (Interviewee T).

It must be acknowledged, however, that despite this democratizing effect, a new category of ‘digital elites’ (who exert disproportionate influence on social media, particularly with international audiences) may emerge or may already exist—this point is further discussed below in section 3.1. Recent writing, drawing on data feminist scholarship (D’Ignazio 2017; D’Ignazio and Klein 2018), has highlighted that the same power relations and asymmetries that typically exclude marginalized or underrepresented populations can come to bear on representativeness in open source material (Dyer and Ivens 2020). Libby McEvoy notes the risk that the invaluable work of content creators, or the ‘source’ in open source information, can be overlooked while the analysts of that information receive accolades for their investigations (McAvoy 2021; Rahman and Ivens 2020). As such, the benefit of amplifying marginalized voices can only be realized when open source investigators practice solidarity,

through deliberate, negotiated, genuine, transnational collaboration between advocates in the global North and the Global South. It requires creating a common framework—or a ‘we’—among actors that redistributes and balances burdens and benefits ‘across vast divides of privilege, geography, language, culture, education, and more’ (McAvoy 2021; see also Minogue and Makumbe 2019).

2.5 Open source information as direct evidence

The potential of open source information to provide direct evidence of human rights violations, of itself, is the subject of debate among investigators. The majority of interviewees believed that the principal utility of open source materials was in either in generating leads or in finding evidence that can then be used to verify or corroborate information found through traditional techniques. This appears to have been the approach of the Group of Eminent Experts on Yemen, which in its 2020 report noted:

The Group of Experts also collected, reviewed and analysed information drawn from a variety of open sources that served either as leads to inform further investigation by the Group, as means to assess the credibility and reliability of other sources or the validity of information, or as part of the corroboration process (UN Human Rights Council 2020b: para. 17).

Many interviewees were keen to stress the continued importance of witness testimony and their belief that open sources could never completely replace the need for on-site investigations and interviews. This conclusion is supported by academic observations. For example, Aronson notes that:

it is crucial to keep in mind that many war crimes and human rights abuses will continue to leave few electronic traces. Like all other forms of evidence, video is not a magic bullet or panacea that will put an end to atrocities. Nor does it mitigate the need for eyewitnesses and victims to provide testimony and for investigators to visit the scenes of crimes and conduct thorough investigations (Aronson 2018: 130–1; see also Alston and Nuckey 2016: 12).

However, as open source techniques are increasingly integrated into UN investigative bodies, a trend seems to be emerging whereby the potential for open source information to constitute direct evidence is increasingly accepted. For instance, several interviewees noted that commanders or other leaders may post on social media in a manner that provides direct evidence of a violation, while in Myanmar, Facebook was ‘a huge source of information on hate speech’ that potentially contributed to genocide (Interviewee E; Stecklow 2018). Interestingly, two recent UN investigative bodies (both of which had dedicated open source investigators on their staff) accepted that verified open source materials may be considered as direct evidence (UN Human Rights Council 2019a: para. 19; UN Human Rights Council 2018c: para. 13). This change in attitude may have been motivated in part by the *Al-Werfalli* case, where the ICC issued an arrest warrant for a commander in the Al-Saiqa Brigade in Libya, primarily on the basis of video footage posted to social media (International Criminal Court 2017), demonstrating the powerful role that user-generated content posted to such platforms can play in documenting events on the ground.

Interviewees also highlighted the importance of open source information released by governments, and how this can be a source of evidence that proves difficult to refute. One example comes from the 2009 conflict in Sri Lanka, where humanitarian access was requested to assist over 100,000 internally displaced persons trapped in a cordoned-off area in the north of the country (OHCHR 2009). The Sri Lankan government severely restricted humanitarian access to the region, claiming that the number of persons present were far fewer than 100,000 (UN Human Rights Council 2015b: paras 973–80). Separately, however, the Sri Lankan Ministry of Defence had released drone footage of the cordoned-off area (UN Human Rights Council 2015b: para. 980), giving a true picture of the numbers of IDP shelters in the area, and confirming the estimated number of persons trapped in that area (UNOSAT 2009). As one interviewee, who had worked on the OHCHR’s reporting of

the situation, noted, ‘this was particularly strong [evidence], as it came from the government, so it [was] difficult [for them] to refute’ (Interviewee A).

Interviewees also raised the potential for open source materials to provide a more complete picture of an event. For instance, one interviewee, who had worked as a social media analyst, gave a specific example relating to the shooting of a protestor:

I remember one case, there was a video circulating online of a guy who was shot ... I found the live stream which showed the entire sequence of events. At no point did he pose a threat to the soldiers, and of course it’s time stamped, so we know when it happened (Interviewee N).

The report published by the UN Commission of Inquiry on the 2018 protests in the Occupied Palestinian Territory explicitly noted the value of open source materials in determining whether the use of lethal force was appropriate (in the context of whether an imminent threat to life or limb existed):

In an effort to understand the proximity of the demonstrators to ISF soldiers or Israeli citizens, the Commission inquired about the lay of the land of each of the five GMR demonstration sites. It based the below determination on a thorough review of Israeli and Palestinian testimonies and open sources, including considerable video and photographic material ([UN Human Rights Council 2019a](#): para. 329).

In a sense, video evidence can be more complete than photographs or witness accounts, and thus its role should not be delegated to a purely secondary one of corroborating other evidence or providing leads. Videos taken from diverse angles may capture different perspectives over a period of time, and may also overcome issues with incomplete or inaccurate memories. As explained by one interviewee with experience across a broad range of investigations, the ‘aperture of any photograph or video is generally going to be larger than the aperture of any person’s knowledge’ (Interviewee Q). This broader ‘aperture’ associated with open source information may help to overcome a ‘community narrative’ whereby a compound version of a story comes to be regarded as the shared truth ([Abrahams and Murray 2020](#): 324).

3. Disadvantages of using open source research in human rights investigations

The preceding analysis showed that the use of open source research enables human rights investigators to overcome many hurdles that have previously hindered fact-finding, including access issues. That is not to say, however, that open source research is a panacea for human rights investigations. Interviews revealed four key interrelated challenges associated with the use of open source evidence for human rights fact-finding. First, open source research can never provide a complete picture of the human rights violations committed in a particular country or region, and investigators need to be mindful of the blind spots of open source investigations. Second, the increasing ubiquity of open source evidence may shape and influence the narrative of atrocities that emerges, sometimes in ways that deviate significantly from lived experiences. Third, investigators noted the resource and security implications of open source research that make the collection and analysis of open source evidence difficult, if not impossible, for some smaller organizations. Last, the well-known problems of disinformation, manipulation of content, and related distrust of digital information, particularly social media content, risks hampering the utility of open source materials, both for

investigations and the accountability processes that may follow from those investigations. We examine each of these concerns in turn.

3.1 Incompleteness

As we have noted elsewhere, open source evidence brings with it significant ‘blind spots’ when it comes to the individuals who have the capacity to capture such evidence and share it online (McDermott, Murray and Koenig 2019; McDermott, Koenig and Murray 2021). The International Telecommunications Union estimated that at the end of 2019, 4.1 billion people worldwide, or 53.6 per cent of the global population, had access to the internet (International Telecommunication Union). That means that 46.4 per cent, almost half the world’s population, had no internet access. This figure is, of course, subject to large global variation. While 92 per cent of adults in the United Kingdom used the internet daily in 2020 (Office for National Statistics 2021), the figure is close to 0 per cent in North Korea (Statista 2021). Gender, income, digital literacy and the urban/rural divide are all determining factors in connectivity. GSMA’s Annual Mobile Connectivity Index for 2021 noted that the pandemic had an adverse impact on affordability of mobile-enabled devices and data worldwide, and that women in low-and middle-income countries were 15 per cent less likely than men to use mobile internet (GSMA 2021).

The availability of open source evidence can also be hampered by society-wide variables. Notably, human rights documenters have been affected by internet blackouts (WITNESS, 2021). In June 2020, for example, following the murder of a prominent musician and activist, Ethiopia shut down the internet across the country for twenty-three days (NetBlocks 2020), in a bid to quell protests. Such internet blackouts now occur with relative frequency, as demonstrated by partial internet shutdowns in Egypt in 2019, Iran in 2020, and Myanmar, Nigeria, and Uganda in 2021. The availability of high-quality satellite imagery, an important form of open source information, can also vary hugely between regions. For instance, satellite imagery related to the Gaza Strip available on Google Earth Pro was, until recently, of low quality, owing to a piece of United States legislation known as the Kyl-Bingaman Amendment.

Even where open source evidence of human rights violations does exist, interviewees stressed that its role in clarifying responsibility for those violations can be limited. For example, user generated content may take the form of a video posted in the aftermath of an artillery strike, showing the devastating effects of that strike. But because the video was shot after the strike, investigators who wish to establish which state or armed group bears responsibility for the attack may well have to look elsewhere. There may be clues in the video or image—such as fragments of shells used that are used only by one side of the conflict, or clues indicating the direction from which the shell was fired—but those content creators who wish to capture the devastation of the attack may not be aware of the information that is most needed by legal investigators and prosecutors, and the content they capture may focus primarily on showing injuries and/or dead bodies.

Some open source evidence may indeed show the individual perpetrators, but the value of this evidence may be limited in, for example, showing a state or organizational policy to commit crimes against humanity, as highlighted by one interviewee who had worked both on UN investigative mechanisms and in international criminal tribunals (Interviewee C). Similarly, the fact that a party to an armed conflict launched an attack against a military objective that also caused civilian harm is insufficient to prove a violation of international humanitarian law—it must also be shown that the harm to civilians was disproportionate to

the military objective sought—and open source evidence may struggle to illustrate those contextual factors (UN Human Rights Council 2018b: para. 37; Kalpouzos 2019). On the other hand, one interviewee, a legal adviser to an investigative mission who had previous experience before international criminal tribunals, noted that the pattern of events depicted in open source content—in their case, the sheer number of civilians killed or injured over a period of a week in one area during an offensive launched by one party—was a strong indication that that party was not taking sufficient care to adhere to the international humanitarian law obligation to take precautions against the effects of attacks (Interviewee U).

3.2 Influencing witness perceptions

The independently verifiable nature of video or image evidence, which decouples evidence of the violation from witnesses' accounts, can play a powerful role in protecting against the uncritical reproduction of accepted or dominant narratives, which is an issue that can arise in research with human subjects (Gandsman 2013; Woodiwiss 2017). Conversely, however, some investigators reported that widely disseminated pieces of evidence sometimes shaped witnesses' accounts and impressions of what they saw, what they thought was important, and, crucially, what they thought investigators wanted to hear. In the context of an investigative mission where large numbers of affected civilians were displaced to camps, one interviewee noted that, 'if there was a particularly controversial video, it would go around the camps very quickly' (Interviewee B). Another investigator, working in the Middle East, observed that if a video was widely available on social media, and witnesses had seen it, there was a risk that it could inform their testimony, consciously or subconsciously (Interviewee V). Interviewees were concerned that, on occasion, witnesses were keen to speak about particular pictures or videos that had gathered attention on social media—given their perceived importance—as opposed to incidents that they had directly observed.

Moreover, there was a danger that a perceived need to post evidence online could do more harm in the long term, such as by prejudicing evidence, where that content was recorded in an inappropriate way. An example was given where an individual posted a detailed allegation of a rape committed by the armed forces to social media. This post was seen by an activist, who contacted the source and interviewed them on Facebook Live, a feature of Facebook that allows users to broadcast a video in real time (Interviewee V). Our interviewee noted the prejudicial effect of the activist's actions on that source of evidence—while the allegation was investigated further, it was deemed that the prospects for a fair, accurate and protective investigation were severely damaged by the existence of this interview.

The danger that open source evidence may influence perceptions of key facts applies not just to victims and witnesses, but also to the investigators themselves. As one investigator noted, 'sometimes [the broader] perspective is a bit lost when you solely base your leads and investigation on open sources' (Interviewee M). Considering the 'blind spots' discussed in Section 3.1 above, there is a risk that a focus on open source evidence may inadvertently silence those, usually less privileged, people who lack the capacity to digitally document the violations that affect them most. If search engines are used for discovery, algorithms decide which results are prioritized, and there can be a bias inherent to those algorithms too.

There is also a risk that investigations may be skewed in favour of certain types of violations that lend themselves better to being captured in this way—such as murder, destruction of property, and artillery or air strikes—and in turn, overlook other, more 'hidden'

atrocities like torture and ill-treatment of detainees, starvation, and sexual violence (McDermott, Koenig, and Murray 2021). However, the extent of this skewing is not clear, and not necessarily consistent across all types of violations. For example, Koenig and Egan have convincingly argued that evidence of sexual violence and gender-based crimes may be ‘hiding in plain sight’ online: open source investigators simply assume that it does not exist, so these crimes may be overlooked in pursuit of evidence of more ‘obvious’ crimes (Koenig and Egan 2022). Indeed, one of our interviewees, working on Syria, noted that there were two key types of violations that usually quickly generated a large amount of online discussion and attention: mass rapes and chemical weapons attacks (Interviewee U). For starvation crimes, satellite imagery can be used to demonstrate changes in land and/or water supply over time, which may indicate that civilians have been deprived of objects indispensable to their survival (Global Rights Compliance/World Peace Foundation 2019).

3.3 Cost, resource, and security implications

Given the huge volumes of open source information available on conflicts, investigators may feel the weight of ‘information overload’, as they analyse vast swathes of data to find the most relevant content, like gold prospectors sifting through mud in search of valuable nuggets (Eldridge *et al.* 2017: 392), and the relevance or importance of a piece of content may only become clear when viewed in conjunction with other sources. Yet, even to get to the position where individual pieces of open source evidence can be located, stored, analysed, and verified assumes a privilege (in terms of the time, resources, skills, and technological capacity) that few may have.

Open source research is often lauded as a cost-effective alternative to conducting lengthy field investigations (Wells and Gibson 2017: 84, 91). From the comfort of their own homes or offices, investigators can trawl the internet to find relevant information (Meyers 2020: 107). In the context of the Covid-19 pandemic, where travel restrictions limit researchers’ mobility both domestically and internationally, the likelihood of investigative work being conducted from a distance is increased. Yet, these apparently low-cost methodologies can often come with hidden costs.

First, and perhaps most significantly, there are costs related to the time needed to collect, preserve, verify, and analyse open source evidence of human rights violations. The time-consuming nature of this work inevitably means that staff time is diverted from more traditional investigative activities to open source research, assuming that the organization has staff with the relevant skills and training in the first place, which, as we discuss further in Section 4 below, is not always a given. Our interviews revealed that some investigations relied quite extensively on collaboration with external actors, including ‘labs’ of university students dedicated to the verification of digital evidence, in outsourcing some of the most resource-intensive aspects of investigations, while others hired (often unpaid) interns to do some open source research. Interviewee M, a UN investigator, stated frankly that their investigative mission relied on student support because, ‘we basically don’t have time to do this [open source analysis]’. While this practice may be mutually beneficial for both the organization and the students or interns who are gaining valuable practical experience, the sustainability of the model is questionable, given the lack of guaranteed funding for university labs. This is compounded by the growing recognition that not paying interns for their labour is inappropriate and can weaken the moral authority and legitimacy of human rights and international organizations (Zangeneh 2020).

Many of the investigative bodies we engaged with in this research did not have specialized staff dedicated to open source research. In one notable example, an individual hired as a translator found their role evolved quite significantly to one of an open source investigator, where the majority of their work involved trawling social media for evidence of incriminating information. The lack of specialist staff did appear to change over the course of the research. For instance, both the Commission of inquiry on the protests in the Occupied Palestinian Territory ([UN Human Rights Council 2019a](#)) and the Group of Eminent International and Regional Experts on Yemen ([UN Human Rights Council 2020b](#)) recruited dedicated open source investigators during our research period. Recent job postings have sought to recruit qualified dedicated open source investigators and information analysts for the UN Independent Investigative Mechanism for Myanmar (IIMM) and UN International, Impartial Independent Mechanism for Syria (IIIM) ([UN Careers 2021a,b](#)). As Catherine Marchi-Uhel, Head of the IIMM has said: ‘we had to hire people whose profile[s] did not exist in the UN system’ ([Marchi-Uhel 2020](#)). For those investigations that did benefit from an open source intelligence expert, such as a specialist on satellite imagery, interviewees noted the huge demands on their time, reporting that these individuals were often ‘stretched thin’ (Interviewee W) because of demand, which can have a knock-on effect on the timeline of the research and publication of reports.

Second, some platforms may allow for limited free searches or database access, but large-scale investigations may require premium access to specialized websites or programs, for example, satellite imagery sites. While many of the tools that have been developed to assist with the analysis of open source evidence are available for free, others require subscriptions. Even where tools are available free of charge, there may be hidden costs—for example, of the computer storage space and internet speed required for tools that run on local servers. The use of cloud-based services may help overcome this barrier, but such services may require privacy trade-offs insofar as they require the user to upload information to the cloud, which they may not be comfortable with—or may even be prohibited from doing. Several interviewees noted that in big organizations like the UN, staff are prohibited from downloading software to their work computers, owing to security constraints, which can impinge on their ability to use new tools to assist in the analysis of open source information.

A major concern in the use of open source information for human rights fact-finding was security—of both the people in the region under investigation and of the investigators themselves. Investigators, adhering to the ‘do no harm’ principle, expressed reservations about using or sharing videos or photographs posted online, on the basis that this may make those who created, uploaded, or were featured in them vulnerable to reprisals. There is, however, a middle ground whereby investigators can harness open source evidence to highlight ongoing atrocities while still protecting people on the ground. For example, Syrian Archive redacted the coordinates of medical facilities from a public report outlining unlawful attacks on those facilities but shared the full report and its data with UN investigators ([Syrian Archive 2020](#)).

For investigators, cybersecurity was a big concern in addition to physical security, given that open source investigations can involve multiple inquiries into persons of interest, which can sometimes border on if not amount to surveillance ([Rahman and Ivens 2020](#): 251). This can in turn risk perpetrators becoming aware that a particular individual has been monitoring their online presence, which may open investigators and others including their families and communities up to reprisals. For example, Dubberley and Ivens recall the experience of

one investigator who used the LinkedIn platform to investigate a person of interest, while logged into their personal account (Dubberley and Ivens 2022). LinkedIn tells users who has viewed their profile, and the impact of this was that the investigator could see that the same person of interest later viewed their own profile. This highlights the need for training on operational security and careful planning of investigations to ensure security.

3.4 Disinformation

The risks of being misled by misinformation, disinformation or other misconstrued or falsified content weighed heavily on the minds of the human rights investigators that we interviewed. As one interviewee with extensive experience across the UN human rights system said, ‘The only product we [the Office of the High Commissioner for Human Rights] market through our work is our integrity’ (Interviewee A). Another interviewee, in the particular context of Syria, noted that the conflict was

very tricky ... because of the media war ... There’s a lot of bias ... a lot of propaganda, it’s being used by various parties to present their position. So it’s very difficult to actually get to what was really going on, what the key violations were, what our messaging should be ... Because there’s so much misinformation out there (Interviewee U).

In general, investigators were extremely mindful of the reputational risks associated with relying on evidence that might later turn out to be false or manipulated in some way. Several referred to the well-known incident where a video, purporting to show a Syrian boy rescuing a girl from crossfire, was later revealed to have been recorded in Malta by Norwegian film makers (YouTube 2014). By the time its true origins were revealed, several leading media outlets had reported on the video and wrongly asserted that it had been captured in Syria (McPherson 2015: 193).

Disinformation is a global phenomenon, and while certain incidents are well-documented, such as the Myanmar government’s spurious allegations that the Rohingya had burned their own homes (Krishna 2017; BBC 2017), investigations operating in every part of the world have to contend with misleading content—or conversely, allegations that the information they source is false, even when it is not. Social media ‘bot’ accounts are used to present propaganda and perpetuate counter-narratives, while allegations of fake news are increasingly weaponized by perpetrators to quell dissent and to try and bring those who share evidence within the reach of the criminal law (Carmichael and Hussain 2019; Strick and Syavira 2019; Conde 2020).

Disinformation is not always created by the perpetrators of mass atrocities—several interviewees spoke of how victims’ interest groups, perhaps in the interest of strengthening their case for justice and accountability, presented evidence of atrocities from other countries or contexts claiming it as their own. This may not be deliberate, as the videos or images may be mislabelled on social media and citizens may share it with UN investigators genuinely believing in its relevance. This highlights the importance of reverse image searching to check when a piece of content first appeared online. Other techniques, such as network analysis, may be used to analyse whether an information campaign is co-ordinated.

Misinformation may itself be based on an incorrect interpretation of open source evidence, which highlights the need for investigators to conduct their own verification of that evidence rather than relying on third party interpretations. For example, the Gaza Commission of Inquiry noted the attempts by Israeli think tanks like NGO Monitor to extrapolate from public sources indicating a victim’s support, or that of their family, for

Hamas's distinct political wing, as justification for the killing of demonstrators. The Commission noted:

[D]emonstrators have been described as ' Hamas terrorists', ' Hamas operatives' and ' Hamas families' rather than people exercising their basic right to protest – including against 51 years of occupation and an ever-deepening humanitarian crisis. The Commission underscores that the political affiliations of demonstrators and that of their family members is irrelevant to the consideration of whether the circumstances of their killing are lawful (OHCHR 2019: paras 407–8).

The problem of disinformation and manipulation leaves human rights investigators in something of a bind when it comes to the reliance on open source evidence, particularly digital open source evidence. They are aware that open source evidence provides a means to overcome some of the access issues that have hampered their ability to conduct investigations on the ground, yet on the other hand, they know that open source evidence relied upon is likely to be attacked and derided as 'fake news'. For example, the lack of access to Kashmir meant that the OHCHR's 2018 report (OHCHR 2018: paras 27–28) drew almost exclusively from publicly available sources, including information obtained through the Right to Information Act in India, as well as parliamentary statements, court orders, police reports, and official statements from Indian authorities (OHCHR 2018: para 28). The report was immediately challenged by Indian officials, who wrote it off as cherry-picking and described it as a 'selective compilation of largely unverified information, aimed at promoting a false narrative' (Chaudhury 2018).

If the possibility of being attacked for utilizing open sources is already an important factor for investigators to consider when weighing up the pros and cons of collecting and relying on this evidence, this is likely to become more acute as the public is increasingly confronted with 'deepfakes'—hyper-realistic audio recordings, videos or images created using machine learning whose inauthenticity is difficult to detect (Vincent 2018). The biggest danger with the advent of this technology is not that a human rights investigation will incorrectly rely on a piece of deepfake footage, but that widespread distrust of content will lead investigators and courts to exclude real footage for fear that it might be an elaborate fake (Edwards 2019; Rini 2020). This may be because they feel the burden of proving its veracity outweighs its epistemic value, or because they know perpetrators will exploit awareness of deepfake technology to call the evidence and findings into question (WITNESS 2019; Gregory 2021).

4. Current UN engagement with open source techniques

Having set out the benefits and challenges of open source investigative techniques, this section seeks to set out UN investigative bodies' engagement to date with open source information as an investigative tool. It examines issues associated with institutional buy-in, the allocation of appropriate resources, training, and the absence (until recently) of a standardized methodology for open source investigations. It shows a mixed approach to the deployment of open source research methodologies across missions, which appear to be motivated by staff and resourcing issues more than a firm view on its utility (or lack thereof) for the particular investigation. The need to resort to open source research is clearly more keenly felt for missions that have been denied on-the-ground access to carry out their investigations, but some that have been denied such access appear to have made less use of user-

generated citizen evidence than others, which is most likely attributable to staffing constraints and the absence of a dedicated open source investigator on the team.

4.1 Institutional buy-in

Based on our interviews, the clearest conclusion we can reach is that the current approach to open source investigative techniques within UN human rights bodies varies quite radically across investigative missions and is in a process of development. While there was clear recognition that open source information could, and should, play a key role in investigative processes, there was a sense that, as an institution, the UN was slow to develop and adapt, and that its approach to open source investigations has so far, in the words of Interviewee L, a long-term employee of the Office of the High Commissioner for Human Rights, been ‘rather conservative’. There was a clear impression that UN human rights bodies were behind the curve in this regard, with one interviewee highlighting that, unlike the UN investigative missions that they worked with, other organizations like ‘Amnesty, ACLU, Human Rights Watch ... now have in house expertise to deal with this stuff’ (Interviewee Q). Exacerbating the lack of internal expertise, some of the UN’s rules around job descriptions and essential criteria may have proven outmoded and mismatched to positions that require open source research skills (Marchi-Uhel 2020).

This lack of full institutional buy-in means that engagement with open source information across investigative bodies is *ad hoc* and suffers from a lack of standardization. This appears to play out in several different ways, with implications for the investigative process. For instance, one interviewee noted that they were unaware that their investigative body could collaborate with university clinics, until it came up during an unplanned conversation with a colleague from a different investigative mission. This has obvious implications in terms of the resources available to an investigative body, and thus on the scope of the investigation itself.

Another important issue, discussed in greater detail below, was the absence of a standardized open source methodology, meaning that different investigative bodies found themselves reinventing the wheel, in terms of determining how to integrate open source information into their workflows. It also meant that distinct offices, bodies and missions treated open source information differently, as regards the kinds of open sources they used and the levels of weight they attached to open source information.

Some interviewees felt that redressing this situation would take time, with one stating that it ‘needs a generational shift’ (Interviewee F). However, despite this somewhat frustrated outlook, things do appear to be changing and there has been a discernible evolution over the timeframe of our OSR4Rights research project (from 2018 to 2021). For instance, and as discussed in Section 2.5 above, several investigative bodies now consider some verified open source information to be a direct form of evidence, marking a distinct transition from the previous widely accepted understanding that open source information could only be corroborative or provide leads. Perhaps most significantly, a few investigative missions have recently and explicitly recruited open source investigators and/or social media analysts (UN Careers 2021a,b; UN Human Rights Council 2019a; UN Human Rights Council 2020b). That said, the recruitment of open source investigators does not appear to be systematic across UN human rights investigations, and it is unclear why open source expertise was considered necessary for some investigations, but not others. Ultimately, there does appear to be a desire to incorporate open source techniques more effectively into investigative

processes, and many interviewees highlighted a welcome nudge in this direction from within the headquarters of the Office of the High Commissioner for Human Rights.

4.2 Resources

A lack of the resources necessary to conduct effective open source investigations was an issue raised by virtually all interviewees. One of the most pressing concerns related to an absence of in-house expertise, when it came to open source investigation. This lack of capacity manifests in different ways. In one UN investigative body, a significant amount of material was available on social media platforms, but there was no capacity to effectively locate, preserve and analyse that information. In this instance a translator ended up carrying out the task of collecting the content. Irrespective of the quality of the work conducted, this is clearly not an ideal situation, given the lack of formal training, including the potential risk of vicarious trauma to that individual. In other situations, a lack of in-house capacity meant that certain components of the investigation were outsourced. During the Office of the High Commissioner for Human Rights Investigation on Sri Lanka—one of the first investigative bodies to engage with user generated content in a significant way—there was simply no in-house expertise capable of verifying photos and videos appearing to document atrocity crimes. Select materials were therefore sent to external forensic experts for authentication (UN Human Rights Council 2015b: para. 215). Although this outsourcing principally occurred during the early stages of integrating online open source information into investigations, it appears that the need to resort to external expertise persists. One interviewee, speaking of an investigative body which submitted its report in 2018, stated that they sought external specialist advice on verification as they were ‘flooded with videos’ (Interviewee E).

UN investigative bodies have been exploring different approaches to compensate for a lack of capacity. For example, several have begun to collaborate with university-based investigation labs, where student teams are trained to conduct open source investigations. One interviewee explained that these collaborations ‘free . . . [investigators] up to focus on other elements and adds expertise unavailable in house’ (Interviewee V). These university investigation labs conduct diverse tasks, from discovery intended to generate lead evidence, to the investigation and documentation of specific incidents. While mutually beneficial, the sustainability of this model, as discussed in section 3.3 above, merits deeper consideration.

In other situations, investigative bodies appear to have deployed workarounds. For example, one interviewee noted that the investigative body of which they were a member did not have the capacity to verify the videos or images which were received or uncovered using open source investigative or digital forensic techniques, ‘but they could corroborate it’ through witness interviews (Interviewee B). In this context, they sought out victims or witnesses who could speak to the content of the videos or images. While this may be a necessity-based workaround, it is not ideal. Depending on the circumstances, finding relevant witnesses may itself be resource intensive, and there is a risk that otherwise verifiable materials may be discarded if corroborating witnesses cannot be found. This approach also sidelines other added values associated with open source investigative techniques, including the ability to conduct investigations remotely, and to access otherwise inaccessible events (including if witnesses are not identifiable or where the risk of approaching them is too high).

4.3 Training

Interviews suggest that there was a need for greater training on open source investigative techniques. Some had received basic training but expressed a desire to learn, for example, ‘how to do verification better’ (Interviewee B) in a constantly evolving landscape, with new tools and techniques coming on stream all the time. Others had not received any open source-related training at all. When training was undertaken it appears to have occurred in a somewhat *ad hoc* manner, without the resources required to capitalize on it fully. For instance, one interviewee from a UN regional office reported that an NGO ‘came and gave us a two day training on satellite imagery, and then what we did was we hired an intern . . . because we didn’t have funds to pay someone’ (Interviewee U). It does appear that the Office for the High Commissioner for Human Rights is attempting to remedy this situation. For example, training sessions have been organized in house for members of investigative bodies and field officers, taught by representatives from Bellingcat and the University of California Berkeley’s Human Rights Center.

The lack of formalized external training opportunities is changing—albeit perhaps not at the scale necessary to meet the scope of demand and not always at a cost that cash-strapped NGOs and intergovernmental bodies can afford. Over the past few years, groups like Bellingcat have expanded the scope of their trainings based on their methodologies, while UC Berkeley’s Human Rights Center has created both an introductory and an advanced open source investigations course for war crimes and human rights investigators, based on the Berkeley Protocol, with the Institute for International Criminal Investigations. Outside of these formal programmes, the Human Rights Center at University of California Berkeley has been training individuals and groups from diverse legal fact-finding bodies and has been joined by Syrian Archive and others to train numerous grassroots advocacy organizations around the world, with fees on a sliding scale. In 2020, Amnesty International launched a two-part ‘MOOC’—a massive online open course—on open source investigations for human rights, which is available free of charge and is hosted on the Advocacy Assembly platform (Advocacy Assembly 2020).

Such trainings comprise an important step in terms of awareness raising as to the potential and pitfalls of open source investigations. As one interviewee with decades of experience as an investigator noted, it is critical to know ‘what it’s even possible to do with open source material in an efficient way’ (Interviewee Q). However, training is only a first step, and is insufficient of itself. One interviewee, for example, noted that training can be ‘really interesting and very good, but you know also, this technical stuff . . . if you don’t use it on a daily basis, you have to be reminded of it’ (Interviewee T).

While we believe it is important that all investigators have a working knowledge of open source techniques, the reality is that in most cases investigators do not have the capacity to conduct open source investigations on top of their existing workload. In addition, open source methodologies are best utilized when integrated into investigation plans from the outset. Otherwise, there is a risk that they will give rise to unanticipated trade-offs that require a waterfall of potential pivots, such as altering digital security plans, and tweaking information collection and management practices. Several interviewees also noted how time-consuming open source investigations can be, with one simply stating that ‘it’s incredibly resource intensive’ (Interviewee M). As such, it appears that while training is important, the real issue is investment in additional expertise and resources. The key question going forward was eloquently summarized by one interviewee:

If OHCHR can build capacity, there is a wealth of untapped information available to investigators. But, it's resource intensive to develop expertise and tools. The question for OHCHR is: can we afford it? Is it worth it? (Interviewee E).

4.4 Methodology

As flagged above, at the time of our interviews, there was not any formal methodology in place for open source investigations. Instead, people tended to acquire open source investigations skills in an *ad hoc* manner, and the use of digital open source methods varied significantly from person to person. This lack of formal methodology was raised as an issue by several interviewees, from a variety of different backgrounds. One interviewee highlighted that 'the current incorporation [of open source techniques] is not systematic' (Interviewee A), while another stated simply that there were 'no formal procedures in place for open source methodology' (Interviewee B). The lack of a formal methodology in place has allowed practice to develop creatively and organically, but risks overlooking key ethical and practical principles that ought to underpin any open source investigation (Rahman and Ivens 2020; Human Rights Center and OHCHR 2020).

This lack of formal methodology and training placed undue pressure on already pressurized investigators to figure out how to incorporate open source investigation methodologies most effectively into their work, and meant that different standards and approaches were adopted by different investigative bodies, an issue that has been acknowledged by OHCHR. However, efforts to address this issue began just prior to the research period and were concluding at the time of writing. In December 2020, the Human Rights Center at the University of California, Berkeley and the United Nations Office of the High Commissioner for Human Rights released the Berkeley Protocol on Digital Open Source Investigations to set common professional standards for incorporating open source methods into investigations of alleged violations of international human rights law, international humanitarian law, and international criminal law. Based on more than 150 consultations and insights from five international workshops, the Protocol was designed to create a common set of definitions, principles, and practices in order to bring greater systematicity to digital open source investigations. Scheduled for release in 2022 in all the official languages of the United Nations, the Protocol is now the basis for a series of trainings being provided to investigation teams, ranging from the International Criminal Court to UN Commissions of Inquiry, to Interpol, and to smaller human rights activist groups.

The Protocol is not designed around best practices, but focuses on minimum standards, in order to facilitate the creativity, innovation and collaboration that have been hallmarks of digital open source investigation practices, while creating benchmarks and baseline expectations for the skills needed to strengthen and systematize this category of investigatory practice. Future methodologies can be expected to develop from the principles and minimum standards set down in the Protocol, but take into account the new technological developments that will inevitably develop over the coming years.

5. Conclusion

Over the past decade, the use of online open source information for human rights investigations has increased exponentially. As has been noted elsewhere, early practice in this space saw a lot of experimentation, with the open source investigative space being seen as something of a 'Wild West—a new, disembodied digital frontier where anything goes, especially

in social media research' (Dyer and Ivens 2020; Koenig *et al.* 2021). The interviews that informed this piece were carried out at a crucial time in the development of this practice, where numerous UN investigative missions had utilized open source information to such an extent that they had hired specialist staff for the role, while others had yet to avail themselves of this new form of investigation at all. In the intervening years, open source techniques have been incorporated into the investigative practices of large human rights organizations like Amnesty International and Human Rights Watch, as well as legal bodies like the International Criminal Court.

For UN human rights investigations, the picture remains somewhat mixed. Looking only at the reports of such missions presented at the 48th regular session of the Human Rights Council in late 2021, we can see that four of eight explicitly refer to open sources in their methodology or reports (the reports on investigations into Libya, Yemen, Syria and Myanmar). Of the four reports that did not explicitly refer to open sources, recourse to such information was perhaps implicit in the two reports of the fact-finding mission on Venezuela (UN Human Rights Council 2021b,c), which referred to the methodology set out in its 2020 report and to information which would be publicly accessible, such as legal case files and official government data. Of the four reports that did explicitly mention open source information, the report of the Independent Investigative Mechanism for Myanmar was notable in its detailed account of its activities in 'scaling up the collection and consolidation of information and evidence through open-source investigations' (UN Human Rights Council 2021a: para. 9), a likely indication of the increased importance of open source methods in its future operations.

Open source information is likely to continue to play an important role in the landscape of human rights investigations in the coming years. This article sought to take stock of the lessons learned from practice and scholarship to date, drawing extensively on practitioners' experiences. We aimed to show that open source information can play an important role in investigations, not only in providing lead evidence and corroborating other evidence, but also itself providing direct evidence of violations, a point that is increasingly acknowledged in practice. In so doing, it can help to overcome some of the access barriers that have hindered investigations and has the potential to give voice to a broader range of people and perspectives than may otherwise have been considered.

It is important, however, to avoid viewing open source information as a panacea to the barriers that investigations face, or as a replacement to engaging with and listening to those communities directly affected by mass human rights violations. As UN investigative bodies increasingly rely upon open source information, it is important that they do so with a clear understanding as to its pitfalls as well as its promises. An appreciation that open source information can be as open to biases, gaps, and frailties as any other form of information, and can perpetuate the marginalization of certain groups and communities is an important first step in this regard. There is a real risk that open source investigations can become distant or removed from the 'source' at their heart, and it is only through the practice of solidarity and adopting an intersectional approach to open source investigations that this can be mitigated (Egan 2019; McAvoy 2021; Emerging Justice Collective 2021).

The best way to ensure a considered, coherent, and careful approach to open source investigations is through meticulous planning and the investment in the training, personnel, and resources needed to fully integrate open source methods within investigative teams. Through adopting and developing best practices in their methodologies and resourcing of open source work, UN human rights investigations can lead the way in demonstrating the

full potential of open source information in the epistemology of human rights and attempting to overcome some of its potential pitfalls.

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