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Gender Equality, Challenges, and Opportunities in Open-Source Research

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Gender Equality, Challenges, and Opportunities in Open-Source Research

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1 ABSTRACT

This qualitative study examines gender representation, inclusion, and methodological practices in the open-source research field. Drawing on 20 key informant interviews, a focus group discussion, and an extensive literature review, the research reflects a field defined by innovation and imbalance. While open-source investigations offer decentralised and accessible entry points, many of the leadership structures, training systems, and funding mechanisms reflect the hierarchies of more traditional research sectors. Participants identified persistent barriers—such as underrepresentation in decision-making roles, algorithmic bias, and the limited use of gender-sensitive methodologies—that constrain equitable participation and influence. However, the study also highlights clear momentum toward more inclusive practices. Many participants described open-source research as uniquely positioned to empower women, global majority researchers,[1] and those from non-traditional backgrounds. They also affirmed that gender-diverse teams improve research quality and ethical accountability. To support this potential, the study presents structural and operational recommendations promoting intersectional and reflexive approaches. It concludes that inclusive research design is not just a question of equity—it is essential to producing relevant, accurate, and ethically grounded investigations. This project was funded by UK International Development. The views expressed are CIR's own and do not necessarily reflect the UK government's official policies.

2 INTRODUCTION

The rise of social media platforms in the 2010s fundamentally transformed open-source research, enabling real-time analysis of political events, human rights abuses, and social movements. During the Arab Spring, platforms like X (formerly Twitter) and YouTube became critical sources for documenting state violence and civil resistance, demonstrating the potential of digital content for verification and accountability. Organisations such as Bellingcat emerged during this period, pioneering digital methodologies—such as geolocation, metadata analysis, and crowdsourced verification—allowing individuals outside governments or traditional media to conduct complex investigations. These developments disrupted conventional hierarchies of expertise and legitimised the role of independent, tech-savvy individuals in shaping global investigative landscapes.

Today, open-source research continues to expand access to analytical tools, creating an increasingly democratised research field free from some of the gatekeeping found in traditional government or academic research. However, the open-source field is increasingly defined by access to advanced technological tools, creating a dynamic where deep-rooted power structures shape aspects of the space. High-profile

[1] "Global majority" refers to people of African, Asian, indigenous, Latin American, or mixed-heritage backgrounds, who constitute approximately 85% of the global population, and is used as a collective term to describe these groups.

investigations are still predominantly led by institutions in North America and Europe, regardless of the geographic focus of the research, reflecting uneven access to training, funding, and specialised tools. These factors influence who conducts research, whose expertise is valued, and which issues gain visibility. Gender disparities are also evident, influencing team composition, research priorities, and the framing of findings. However, awareness of gender bias and its impact is increasing, along with an understanding of how intersectionality influences research quality and outcomes. Individual researchers and organisations are already conducting promising work demonstrating the efficacy of open-source methodologies to expose gender-related issues such as online gender-based violence (GBV), human trafficking, and the establishment of radicalisation pathways.

The momentum in this space is positive. However, additional work—including research and framework development—is still needed to comprehensively address ongoing gender bias, algorithmic discrimination, and structural participation barriers, which hinder the field's ability to capture gendered experiences. Moreover, the underrepresentation of women and marginalised communities restricts the range of professional expertise in the space, limiting the integrity of the research itself. These gaps are not confined to the underreporting of GBV; they extend to the frameworks used to select sources, define investigative priorities, and interpret collected data.

As a result, open-source research must move beyond surface-level inclusion to realise its democratised potential. This study contributes to that effort by identifying systemic barriers, methodological shortcomings, and practical interventions, offering concrete recommendations for individuals, funders, and organisations looking to foster more equitable, representative, and ethically sound research practices.

2.1 OBJECTIVES OF THE STUDY

This qualitative study investigates the extent to which the open-source research field is inclusive, focusing on the representation of women and other underrepresented groups. It explores institutional and systemic barriers limiting equitable participation, especially in leadership and decision-making roles, and examines methodological challenges in applying a gender lens throughout the research process. These challenges include a focus on issues with data collection, digital investigation techniques, and algorithmic bias in AI-driven tools. Through engagement with a diverse range of open-source practitioners, the study captures the perspectives of researchers to understand the consequences of excluding gender considerations, particularly related to the validity, scope, and ethical grounding of research outcomes. Finally, the study offers policy and organisational recommendations to strengthen gender representation, promote ethical research cultures, and support the integration of gender-sensitive methodologies across the open-source research field.

2.2 RESEARCH QUESTIONS

This study seeks to answer the following key research questions:

1. How inclusive and diverse do practitioners perceive the open-source research profession to be?
2. What are the primary gender diversity challenges reported by open-source research professionals?
3. To what extent are feminist perspectives integrated into decision-making, research methodologies, and data analysis?
4. How do gender biases and algorithmic discrimination manifest in open-source data collection and processing?
5. What are the risks and consequences of excluding gender perspectives in open-source research?
6. What steps can organisations, funders, and stakeholders take to lower barriers to participation and foster inclusivity in the field?

3 LITERATURE REVIEW

3.1 THEORETICAL FRAMEWORKS FOR UNDERSTANDING GENDER AND OPEN-SOURCE RESEARCH

Multiple theoretical frameworks guide this study in analysing gender representation, methodological challenges, and power structures in open-source research. Feminist standpoint theory, as articulated by Harding (1991), emphasises that knowledge is socially situated, and perspectives from marginalised groups challenge dominant epistemological assumptions. Within open-source research, this perspective highlights how women and other underrepresented groups encounter professional exclusion, security threats, and methodological oversight in digital investigations.

Intersectionality theory, introduced by Crenshaw (1989), further informs this analysis by examining how gender interacts with race, class, and other aspects of identity. While explaining her work on “missing datasets”, Onuoha (2022) argues that datasets used in digital investigations often reflect existing societal biases, creating a dynamic where critical gendered perspectives are excluded. This exclusion can be particularly evident in open-source research, where emphasis on user-generated content means that the most visible narratives often come from digitally connected young, urban, and male users, creating a situation where the experiences or hardships of women and other underrepresented groups are poorly captured. However, variations to this dynamic exist across countries, often related to the size of a given nation’s digital divide. Countries with greater technological access often experience higher online engagement from women and traditionally underserved communities, impacting research outcomes because the diversity in experiences is more easily captured.

Critical algorithm studies also contribute to this discussion, particularly those focused on how bias is embedded in digital technologies. D'Ignazio and Klein's (2020) book, *Data Feminism*, argues that data is neither neutral nor objective; rather, it mirrors historical power structures that prioritise mainstream narratives while excluding others. Noble (2018) and Benjamin (2019) further demonstrate that AI-driven tools, including those used for open-source research, risk reinforcing societal inequalities rather than eliminating them.

3.2 KEY STUDIES AND DEBATES

3.2.1 GENDER DISPARITIES IN INTELLIGENCE, INVESTIGATIVE RESEARCH, AND OPEN-SOURCE ANALYSIS

While the literature review did not specifically find data on gender representation in open-source research, studies in related fields of intelligence, investigative journalism, and digital security highlight persistent barriers impacting women's participation. Reports from think tanks such as the Wilson Center (2019) and Chatham House (2021) and work from Stakelbeck (2013) document how intelligence agencies and national security organisations have long relegated women to analytical or administrative roles, limiting their influence on strategic decision-making. In their article, "What Would a Feminist Open-Source Investigation Look Like?", Ivens and Dyer (2020) critique open-source research for mirroring these exclusionary patterns. Their analysis reveals that gender biases in intelligence fields carry over into open-source research.

In journalism, similar dynamics exist. North (2016) describes how male-dominated professional networks shape hiring and promotion, limiting women's access to high-profile investigative projects. Research by Henrichsen, Betz, and Lisosky (2015) also indicates that female investigative journalists experience disproportionate levels of online harassment, particularly when reporting on GBV.

Another significant component of gender disparities in open-source research is the invisibility of certain types of violence. Awan (2016) argues that open-source research often prioritises visible acts of violence—such as armed conflict and public demonstrations—while neglecting less visible harms disproportionately affecting women, including domestic and sexual violence. This discrepancy results in an incomplete picture of the security threats and violence patterns impacting women, reinforcing structural blind spots that limit investigative methodologies.

3.2.2 ALGORITHMIC BIAS AND GENDER REPRESENTATION IN DIGITAL INVESTIGATIONS

Researchers have also voiced concerns about algorithmic bias since AI and machine learning platforms play a growing role in open-source investigations. Buolamwini and Gebru (2018) demonstrate that facial recognition technologies perform worse on women and individuals with darker skin tones, increasing the risk of misidentification.

These biases are not haphazard—they reflect structural inequalities in AI training datasets.

Onuoha (2022) also critiques the assumption of neutrality in data collection, arguing that data systems disproportionately prioritise narratives from dominant social groups. Search engines and content-sorting algorithms favour sources with large followings and content written in widely spoken languages—particularly English—while deprioritising data from marginalised communities. As a result, gender-based violence and disinformation campaigns targeting women are often underrepresented in open-source datasets. D'Ignazio and Klein (2020) further emphasise that the invisibility of gendered experiences is not just a data collection issue but a fundamental methodological flaw. Their research highlights that AI-driven misinformation tracking tools often do not identify gendered disinformation campaigns, particularly those targeting female politicians and activists.

3.2.3 COGNITIVE BIASES IN OPEN-SOURCE RESEARCH

In addition to algorithmic bias, cognitive biases shape how open-source researchers interpret and prioritise data. McDermott, Koenig, and Murray (2021) identify several key biases in open-source research. According to their work, associational biases affect how analysts interpret video footage, causing them to disproportionately reach conclusions shaped by their own identity and assumptions rather than reality. The availability heuristic is also common, leading investigators to prioritise easily accessible data, often favouring public demonstrations over private acts of violence. Further, groupthink occurs when investigative teams lack diversity, resulting in internal consensus reinforcing preexisting assumptions, and information bias manifests when research methodologies overlook local terminology and coded language. This is particularly seen in cases involving sexual and gender-based violence.

3.3 GAPS IN EXISTING RESEARCH AND RATIONALE FOR THIS STUDY

Despite the growing use of open-source research for conflict monitoring and documenting human rights abuses, academic and practitioner literature has paid limited attention to how social identity and power influence the field. Much of the existing research centres on technical innovation, verification methods, or operational successes, leaving gaps in understanding how gender and intersectionality shape the research process. There is also a lack of analysis on whether and how algorithmic tools reinforce exclusionary practices or how knowledge hierarchies affect what is recognised as legitimate evidence. These gaps in the literature contribute to a growing recognition that additional work is needed to expand our understanding of ethical practice in the field. This study addresses these gaps by centring the lived experiences of practitioners and examining how power dynamics operate within the open-source research ecosystem.

4 METHODOLOGY

4.1 RESEARCH APPROACH

This study employed a qualitative approach grounded in thematic analysis, drawing on critical feminist and intersectional research perspectives. By integrating an intersectional feminist lens, the study examined how gender, race, and other intersectionality markers influence access, participation, and representation in the open-source research field. As part of this lens, the findings are presented using a feminist methodological approach, emphasising the importance of centring lived experiences. To accomplish this, the study's analysis includes extended participant quotations that preserve the integrity and nuance of their contributions; however, some quotes have been adjusted for readability by removing discourse markers or vocalised pauses. None of these adjustments change the intent of the statements.

4.2 DATA COLLECTION METHODS

This study was based on a literature review, KIIs and a focus group discussion (FGD). Data collection was designed to capture diverse perspectives from professionals working in open-source research, including those affiliated with government, the private sector, international NGOs, think tanks, academia, and the media.

A total of 20 semi-structured KIIs were conducted, each lasting approximately 45 minutes. The interviews followed a purposive and snowball sampling approach to ensure the data collected was relevant and meaningful. The KIIs explored participants' experiences in the open-source research field related to gender representation, institutional barriers to access, methodological challenges, and the impact of algorithmic bias. Discussions were recorded using Otter.ai for transcription, ensuring efficiency while maintaining participant confidentiality.

One FGD involving 21 participants was conducted after analysis of the KIIs was complete to validate initial findings, identify additional perceptions of the field, and refine research recommendations. The session was intentionally designed to capture the perspectives of open-source researchers who had already participated in the study and those new to the research. This collaborative format allowed the research team to test assumptions, challenge interpretations, and sharpen recommendations based on group dialogue.

4.3 DATA ANALYSIS

The team used thematic analysis to identify recurring patterns related to gender representation, institutional barriers, and methodological challenges in the open-source research field. This method allowed systematic coding and categorisation of data to establish key themes while maintaining flexibility in capturing contextual insights. NVivo, standard software for organising qualitative research data, was used to manage, sort, and code the interview transcripts and resulting data. Findings from

the KIIs and FGD were then cross-referenced with the literature review data to enhance validity, ensuring multiple sources of evidence support the study's conclusions and reducing potential biases.

4.4 ETHICAL CONSIDERATIONS

Given the sensitive nature of topics surrounding gender representation, institutional barriers, and potential professional risks, rigorous ethical safeguards guided this study. Participants provided informed consent before their involvement, and all responses were anonymised to maintain privacy. Data collection, storage, and handling adhered to strict security protocols, with access to interview transcripts and raw and coded data limited exclusively to research team members. Ethical procedures aligned with best practices established by the internationally recognised Collaborative Institutional Training Initiative (CITI Program). Additionally, the lead researcher holds a valid certification in CITI Group 2: Social-Behavioural-Educational (Non-HPD) Research.

In the findings, no personally identifiable information is included. Further, participant gender is excluded unless it is required to add context to a specific quotation or directly stated by the participant.

5 FINDINGS

This study reveals the tension between the inclusive potential of open-source research and the power of the structures underpinning it—structures historically rooted in the reinforcement of traditional hierarchies. Gender disparities continue to exist, as detailed by many of the participants. However, an undercurrent of optimism was seen across the interviews shaped by the decentralised and constantly evolving nature of the open-source field. While the findings detail the challenges identified, they also highlight clear opportunities for growth in research structure, data collection, and the frameworks, policies, and training necessary to support the open-source space.

5.1 REPRESENTATION, POWER, AND INCLUSION IN OPEN-SOURCE RESEARCH

The study finds that, like other research-oriented fields, disparities within open-source research often align with the type of work being conducted. Male open-source researchers are more commonly engaged in security-oriented domains such as military intelligence, cyber investigations, and geospatial analysis. In contrast, women tend to work more on topics focused on human rights, GBV, and gendered harassment. While participants generally agreed that open-source methodologies are more accessible than traditional research or intelligence work, many noted that the structures supporting the field—such as funding pathways, training networks, and organisational leadership—remain somewhat exclusionary. Several respondents noted that the dominance of white men in open-source leadership reinforces this undercurrent of exclusion since the individuals setting standards for best practices,

designing tools, and leading training sessions tend to be Western white men. This, in turn, shapes who is hired, mentored, and promoted. As one participant explained:

> *[The] biggest voices in OSINT are white and male, kind of the biggest voices of authority, the biggest folks that are putting out tutorials. So, with the kind of lead voices being white and male, it inherently has a tendency to skew that way when it comes to folks doing that research, folks getting interested in this area, and again, folks getting hired into positions of influence. […] I feel like I have seen it be very male-dominated. I feel like I've seen any woman who has a position of influence really struggle a lot and have to face more consequences when it comes to their decision-making versus males who are in similar same positions.*

This perception of being an outsider—due to race, gender, or geography—was described as inherently limiting by several participants. The previous participant described it as:

> *[Feeling] like a token can be discouraging, period. […] It's kind of that thing where folks of colour and women might need to feel like they need to be twice as good to be seen as the same as a colleague. […] It influences your work and how well you can do it because it influences your quality of life. It influences your mental health. It can be like when you're bringing up an issue, and, you know, it's a workplace—so, you don't bring it up lightly—but you bring up an issue, and it's dismissed. And to keep advocating for yourself can get really exhausting and demoralising.*

Similar gendered power dynamics were reported across several professional environments, suggesting these subtleties are not limited to one or two industries within the field. When asked about their views on gender balance in open-source research more broadly, one participant stated:

> *[Gender balance] is very weak. […] I will tell you that in all of those roles, I've always begun—even though I had the same qualifications and experience, maybe even more in some ways—I always started as logistical help or admin help. […] So, in terms of decision-making, I can't think of a time I've seen or experienced decision-making power in terms of females. […] Like 90% of my team is usually male colleagues. So, when I first noticed that […] it almost feels like a privilege to be there. But it shouldn't feel like a privilege, right? So, it shouldn't feel like a privilege because I'm—and women like me and females like me are—just as capable.*

This theme emerged consistently across the interviews, including among male participants. Several respondents reflected on this dynamic, theorising that these imbalances may be shaped by the field's close association with the technology

sector—an industry long dominated by men. This intersection is critical to understand since it reveals a tension between the more decentralised and democratic ethos of open-source research and the hierarchical, sometimes exclusionary tendencies seen in tech. As one participant observed:

> *I've been theorising why, and I think part of it might be because this intersection with technology has a lot to do with [...] the coding and the different tech tools and the different methods that are a little more skewed towards computer science than with human rights research. And I think it's because of this skewing towards tech and computer science, which I understand are usually male-dominated.*

This push-pull between the egalitarian aspirations of open-source research and the structural legacies of the tech industry will likely continue to influence the field's evolution. While participants acknowledged progress in addressing this tension, particularly in increasing women's visibility, many felt that current efforts and progress remain at the surface level. As one participant explained:

> *They say like, 'We are a global news organisation, and we have partners from the Global South, and we also have ten researchers from Africa.' Like, what does that mean? Yes, you do have ten. It could look like, on the surface, you being inclusive, but actually, are they empowered enough to speak their mind? Are they empowered enough to talk about their stories? Are they empowered enough to go out and do research in their communities and report back, or are they just reporting to you guys and not given any space to think about who they are, what they are, what they're interested in? The content, for me, it's not just seeing a number or diversity.*

Despite these barriers, participants underscored that challenges with representation and power are based on structural limitations rather than a lack of skill or capacity. When asked whether there are barriers to women's participation in the open-source research field, one participant stated:

> *Not in attempting to get into it. I think [the barriers are] in attempting to get hired and especially get hired in roles of either management or decision-making or influence. [...] I think, with OSINT, you can self-train online. There are so many tutorials. There's no barrier in terms of learning this skill. I think there's a barrier in terms of having influence.*

These dynamics highlight the importance of funders, organisations, and team leads appreciating the difference between access, inclusion, and influence. Many participants felt that current efforts to promote inclusion are tokenistic at best, creating a dynamic where the research risks missing key voices, ultimately producing a lesser product.

5.2 BARRIERS TO ENTRY AND GEOGRAPHIC DISPARITIES

Although open-source research is framed as an open and democratic practice, the study suggests that participation in high-impact investigations remains limited to those with institutional affiliations, adequate funding, and access to specialised tools. Several participants raised concerns about the high cost and inaccessibility of open-source research platforms, especially those requiring institutional logins or premium subscriptions. These constraints disproportionately exclude independent researchers, women, and those working in global majority contexts.

When asked about whether geographic location impacts participation, one participant explained:

> *Absolutely, in terms of what technology people have access to, what they can afford, whether their internet is stable or not. [It] affects what they can produce and affects how they can produce quality work, notwithstanding their own actual skill and capability. I think that there are regions that we study that have less stable internet connection, and that can affect their working hours and their ability. Again, [this is] nothing to do with their actual capacity and their know-how. [It's about] a barrier.*

Several participants discussed the influence of financial standing, nationality, and government support when entering the field. When considering factors that influence diversity, one participant observed:

> *One is financial standing; how much money you have and how much you can use for certain things. Two is nationality, where you're from. We can also say citizenship/origin. Another thing I've seen is what I'll call a coaching or mentoring model that should exist. OSINT is so scattered. […] I think mentoring or coaching would really help. People that don't do OSINT full-time really need that.*

Another participant echoed the importance of inclusive knowledge sharing: "Equitable access [is needed] when it comes to OSINT tools. […] OSINT needs to be a leader in terms of sharing that knowledge, sharing the tools. A lot of the tools are…you need to pay for them, and they can be quite expensive. So, the financial status of an organisation or individuals should not limit investigations."

Beyond tools, participants expressed concern over the lack of cultural and linguistic competence in the field. Many felt that analysts lacked the training to navigate the sociopolitical or gendered nuances of the regions they study. One participant noted: "Sexual violence and conflict […] a lot of times, those things are hidden because they're not outright reported on because people don't see them as a gendered crime or a gendered thing that's of interest or that should be looked at. So, you also have to learn

about local language, coded language, things like that. I think there's a lack of education and a lot of blind spots that are skewing findings."

Concerns about researchers' physical and digital safety, particularly those living in repressive regions, were also raised. One participant from a global majority country shared: "One thing that I want to mention is the difficulties being an OSINT researcher, [particularly] a woman OSINT researcher. When you come from these other [...] contexts, it's really dangerous to let it be known you're doing that kind of work, especially when you're a woman." Similar sentiments were echoed by other participants, suggesting more needs to be done to ensure funders and organisations factor in protection, particularly for researchers from different regions. It is a mistake to assume that all open-source researchers operate in uniform or safe environments. This lack of safety affects personal well-being and has downstream consequences for professional visibility. When researchers cannot publicly share their work or must operate anonymously, they face barriers to recognition, limiting access to speaking opportunities, career advancement, and broader professional networks.

5.3 INTERSECTIONALITY

Participants repeatedly emphasised that gender disparities in open-source research cannot be understood in isolation from other social identities and power structures. Instead, the intersection of race, class, nationality, language, sexual orientation, and institutional power significantly shapes researchers' opportunities, perspectives, and risks—ultimately shaping the research itself. Several participants argued that intersectionality should be a foundational research design and implementation lens. As one participant explained:

> *I am often against the gender-only analysis. I don't like it because I just know you don't enter into a room just as a woman. You enter into a room as a Black woman. If you are a homosexual person, as a Black lesbian woman. I don't think one embodies one identity only. That goes back to also the men—like you cannot just say like 'boys' and 'women' like that. That's a very flawed analysis.*

Participants also noted that even the platforms most used in the field reflect gendered usage patterns. One FGD participant observed that open-source research more heavily draws from platforms frequented by men, further skewing what is visible to researchers. However, this dynamic is more complex than individual bias. The FGD participants highlighted that platforms like Telegram and X are easier to search, scrape, and analyse because they prioritise text-based content and offer fewer access restrictions. In contrast, Meta-owned platforms such as Instagram and Facebook—which tend to have more female users and rely on visual content—are more restricted and technically challenging for research purposes. This is not merely a matter of encouraging analysts to diversify their sources; it highlights structural limitations.

These limitations warrant changes to research resourcing, the development of new methodologies, and investment in tools that more effectively capture underrepresented data.

This trend of capturing data from platforms focused on men's voices is particularly relevant in investigations of GBV, where affected populations—often women—may not communicate in ways that are not recognised by mainstream open-source tools. As one participant stated, "Many of the platforms that are the easiest to collect data from are dominated by male voices. Understanding this is critical to creating a holistic picture when conducting research."

This same participant added, "It doesn't matter who's doing the work. It doesn't matter if it's a man or a woman or a trans or non-binary. It doesn't matter for me. What matters is what kind of lens are you using? […] What kind of methods are you using to do research, and the question of technology and access and open source and others? Because I think the lens you come into this with determines what you're going to get out."

A theme that emerged in several interviews when asked about intersectionality involved the need to consider who is seen and unseen when collecting data, which the participants stated is more complicated than whether researchers are using a gender lens:

> *I think one of the main challenges is actually access to technology. I think that's very important, because not everyone has access to mobile phones. […] In some areas, the states mindfully decide to cut internet, for example. One good example is Iran. So, I worked a lot on the protests in Iran. There were a lot of videos coming from there, but, for example, in the areas where there was a lot of crackdown on protesters, including women […] we didn't see anything. So, we didn't, we don't have footage from those places. One, because people don't use their mobile phones in all these areas. […] Second, even if they use it, they're afraid to take photos and images. […] So, this shows that sometimes there are big stories that we are not able to cover in open source because people don't have equal access to technology.*

The exclusion of intersectionality was not just seen as an analytical shortcoming but as a practical and ethical failure. One participant noted that platforms, funders, and leadership must address the reality that open-source tools and institutions often reproduce colonial power dynamics:

> *AI bias has been—and continues to be—one of the core problems that we are experiencing, specifically as a Black African woman […] This conditioning also tells you the ways in which the world sees us as women. The Global North white-man developers do not have any idea or*

understanding of how diverse the world is or a depth of understanding of intersectional identity conversations. It tells you how the structure of the world is still in a colonial structure.

5.4 GENDER BALANCE AND USING A GENDER LENS IN RESEARCH TEAMS

While not 100% uniform, most participants noted that, in their experience, the gender composition of open-source research teams is not evenly distributed across thematic areas. As referenced earlier, human rights investigations, GBV documentation, and disinformation tracking appear to attract more women, whereas cybersecurity, military intelligence, and state-based geopolitical analysis are heavily male-dominated. The participants did not attribute this division to individual preferences; instead, they primarily viewed it as a reflection of funders' systemic and financial priorities and the hierarchical valuation of 'technical' versus 'social' expertise. Moreover, it appears to be related to gender biases in the adjacent fields feeding into open-source investigations, such as cybersecurity, military intelligence, and digital forensics.

One participant highlighted the disproportionate burden placed on women in male-dominated research environments: "There is a sad perception that men are better suited for technical tasks, while women are expected to focus on administrative roles [...] I have to repeatedly prove my expertise and do double the work to be taken seriously." However, despite this and similar responses, several participants shared examples of more inclusive team dynamics. As one respondent described, "In terms of gender inclusivity—speaking male-female, in terms of that—I think it does pretty well. I've seen many female colleagues either collaborating with me or leading projects. So, I have to say that, in terms of that [...] it seems to be doing relatively well."

Other participants echoed this sense of optimism, reinforcing the widely shared view that diverse teams enhance both the quality and scope of open-source research. One participant shared:

> *I'll also say that men and women experience the world and life in different ways. We're not saying that what women experience is more rich and detailed than what men experience. However, spaces usually have secured time and space for men for the most part. So, it would be good if we were now not just allowed but supported. [...] Women definitely have that unique worldview and have their unique experiences. [Men and women] don't experience life—the world—the same way. [They] don't experience events, don't experience cultures, understand the perceptions. So, why the heck not bring in women to be a part of it?*

Participants also shared how gender diversity improved team dynamics and methodologies. While speaking about her male colleague, one participant reflected on the complementary strengths they each bring to the table:

> *He pedals training a lot. He pushes out training opportunities for the team. And a lot of them are things like, you know, 'There's this database. […] Do you want to look at this flight radar? […] This is the team that you should contact if you want to be trained on it' and all this kind of stuff. So. he's pushing that stuff out, and he will think about those things much more than I would. Whereas, I would probably go straight to my softer stuff, my interpersonal stuff. […] I think there's a strong argument to say, like real mixed teams—whether that's men or women or whether that's just those two different backgrounds—is important.*

In tandem with the opportunities presented by a gender-balanced team, participants also pointed to the risks of excluding gender perspectives, which were widely acknowledged across the interviews. One participant explained:

> *I don't mean to be dramatic, [but] the risk is enormous. If you're not doing or if you're not considering gender, you're missing big chunks from the very beginning when you're pulling together a team. So, including women in your team to design that particular task or project or whatever you have at hand, […] I think it touches on everything. Yeah, the risks of failing to consider gender are everything. So, if gender is not included, these projects will fail. They fail in a sense because they don't have all these other dimensions. They don't have the dimensions. So, it's work that goes on—it's publishable—but no one is paying attention to it.*

Another participant stated:

> *First, the point of open-source research is to actually present factual information, or to explain how certain events unfolded with the facts in mind. If you omit a gender lens to in any type of research, that means that you just didn't represent the reality as it is. Because, obviously, there are exceptions, but in most cases, gender does play a role in events, whether the women are victims, whether the women are survivors, whether they're bystanders, or if they're researchers. So, in order to reflect the societal issues properly as a researcher, you do need to have it. Or, [if you] don't have it, then that automatically means that you have omitted part of the reality or part of the story in your story, or that you have distorted the truth. One of the two.*

When asked how organisations could improve, participants frequently returned to one recommendation: inclusion must begin with hiring and be embedded in team culture. One participant specified, "I think I'm not sure what the ramifications of it are, but I think it needs to start, at the very least, at the most basic level: include women in your team […] and be confident. Where that can go and how we can include women

better will come up, but you need to include women in your teams, [...] and you need then listen to them."

5.5 ALGORITHMIC BIAS AND TECHNOLOGICAL EXCLUSION

A recurrent theme throughout the interviews and focus group discussions was the significant role algorithmic bias plays in shaping the priorities and outputs of open-source investigations. Participants consistently highlighted that many open-source tools and AI-driven platforms are created by male-dominated teams, often in Western nations, affecting how threats are defined, prioritised, and investigated.

One participant explained:

> *I would like to know where the training data comes from and who's applying the training data, right? Because if it's going to be a bunch of white male engineers in Silicon Valley training the models and seeking out their friends and buddies to test them out—providing the betas—yeah, of course, it's gonna be skewed in that direction. But, if it were a diverse group explicitly when it first gets started, where we have to have this many of this cultural background, this many of this race, this many of this ethnicity, this many of this gender, I think it'd be more representative of the entire population.*
>
> *A good example of that is [...] the Google algorithms, circa 2005 to 2007. Whenever you searched just the term white woman, you would come up with models on a beach or [...] people walking down the street; maybe they're going into a coffee place or something. But if you just put in black women, and that's it, you would find pornographic images, right? And when you looked at the engineers that were working for those major search companies, such as Google at that time, like they were predominantly white males. So, the training data they use for those indices, they didn't supply [...] the correct keyword information for the SEO.*

Another participant stated that technology usually reflects offline bias because humans create technology: "Technology is not created in a vacuum [...] We need to enforce diversity, equality, and inclusion in tech companies because the tools we rely on also need a gender perspective." Others echoed this, stating, "Technology reflects the biases of whatever data it was trained on—it mirrors the bias of its creators," and, "Any kind of technology is only as good as the people who build it [...] If you're inherently building bias into technology, then it's only going to give you biased results."

For participants from global majority countries and women of colour, algorithmic exclusion was not only frustrating but deeply political. One respondent stated, "There is a power dynamic between [the] Global North and Global South, and these are

replicated in technologies that we access. And then it is even worse for women because then it's even difficult to get into these spaces because of such structures." As a result of these challenges, some participants pointed to emerging alternatives. One respondent stated:

> *We have seen African programmers trying to programme and do some work around, you know, cultural issues that they see. […] It's one thing to say like, 'There is a gender gap in technology—there is an observable thing and AI bias [exists].' We can continue saying that, and I think we will continue saying that for the 20 years to come. [But] at the same time, we kind of have to do some work around it—to reverse it and at least minimise the gap.*

Across the board, the participants called for structural change in how open-source tools are developed, stating that change is not only desirable but essential for equity and investigative accuracy. One participant highlighted that technology often reflects offline bias because it is not created in a vacuum—people create it. They stated that one of the biggest challenges with this dynamic is that the platforms are designed around English. This has downstream effects because other languages must be layered over the original platforms, limiting the collection and analysis of non-English content. Moreover, this participant highlighted:

> *[…] we need to also have in mind that the technology we use for open source, […] it's not necessarily intended primarily for open-source research. It is actually primarily intended for military intelligence […] where there is historical discrimination against women. So, in a way, the tools that we use and that we adopt, they're actually developed for a very masculine profession and very masculine use.*

5.6 FUNDING STRUCTURES AND RESEARCH PRIORITISATION

A recurring theme throughout the interviews and focus groups was the extent to which funding structures shape research agendas in the open-source field. Rather than being driven solely by investigative need or social relevance, participants emphasised that funding priorities—often set by governments, large institutions, or private donors—determine what is researched, how it is researched, and by whom.

Several participants observed that gender-focused research is systematically underfunded because funders likely see it as less profitable, less prestigious, or too politically sensitive to attract the backing of mainstream funders. One participant noted:

> *It's one of the problems with funders—they are far more interested in numbers, far more interested in quick research, far more interested in quick fixes than in work that actually sits through and then looks into*

some conversations. The other part is most organisations don't invest in research, or if they invest in research, it's almost with the intention to report back to the donor, as opposed to making the research output to build movement or to build a social consciousness or awareness.

Others discussed the constraints imposed by donor-driven mandates, particularly those from the security and defence sectors. One respondent explained, "It certainly sounds like if it's a priority, then they can push for that. […] I have never been a donor, so I can't speak to how that works, but if it's one of [the donor's] priorities, it seems like that would then follow through into priorities of organisations if they're being funded by them."

Participants also described institutional hesitancy in publishing research findings on gendered topics due to perceived risks to their relationship with funders. One respondent explained, "I've seen research on gender-related security issues withheld from publication due to concerns that funders might find it politically sensitive. There's a lot of self-censorship that happens because the organisation doesn't want to risk the funding relationship."

The findings suggest that donor preferences and financial constraints act as indirect censorship, shaping what is investigated and what is deemed visible, valid, or urgent. One participant proposed a shift in donor engagement practices: "Donors can enforce gender policies by requiring organisations to have mechanisms in place to promote diversity and inclusion," suggesting the need for structural reforms in how entities with funding power approach the open-source research process.

5.7 TRAINING AND STANDARDISED RESEARCH PRACTICES

A critical issue raised by participants was the lack of standardised training in gender-sensitive methodologies, ethics, and reflexivity in the open-source field. Many participants reported that they had never received training to recognise gender bias, navigate ethical dilemmas, or apply a reflexive lens to their positionality. One participant explained that while capacity building is often recognised as essential within civil society spaces—where researchers are routinely trained—this same level of intentionality must be applied to the open-source field. "Even if you come from academic spaces, it's always good to keep on being reminded of what is important, where to chart a new skill, how to communicate with people, how to think about ethics in research. And then, what are the things that have been produced recently about research conversations?" They further emphasised that open-source researchers and organisations must prioritise continuous learning and knowledge development to remain rigorous and inclusive.

Another interviewee pointed to the need for institutional frameworks focused on ethical accountability: "If there is an investigation happening, there should be a standard operating procedure (SOP) in terms of how to conduct that research. So,

there should not be a difference in how to conduct the research." Similarly, several respondents called for the development of SOPs and training on how to detect and document sexual violence using open-source techniques.[2] They emphasised the need for contextually relevant coded and derogatory language glossaries. One participant stated:

> *[…] Researching sexual violence using open source is extremely difficult, and I think that's one of the hardest parts to investigate. For example, you know, when the military comes into a village, they always force women to do cooking and cleaning and sexual violence. A lot of times, those things are hidden, because that's not outright reported on because people don't see that as a gendered crime or a gendered thing that's of interest. […] There is still a lot of education to be done around that to even know what to look for as red flags. […] So, you also have to learn about local language, coded language, things like that. So, I think it's a lack of education and a lot of blind spots that are skewing findings.*

Another participant stated, "I do think that there needs to be, like, a mindful decision coming from the management, or in the context of journalism, from editorial to have procedures in place that will ensure that a gender lens is always included in the research." They went on to state that having processes will prevent the omission of certain types of gender-focused crimes, which are often overlooked.

Participants also emphasised the need to train researchers on reflexivity, which is commonly taught in academic research but rarely addressed in open-source work. One respondent explained, "I don't think [having a gender lens] is the only criteria one should follow in research. I think funders need to advocate for that, that researchers have to be encouraged to look into themselves, to explore themselves, to reflect on research, reflect on their positionality, to reflect on the power they have as a researcher, to reflect on many of the conversations as they are doing the research."

This emphasis on training researchers in reflexivity and bias speaks to the need to ensure open-source research methodologies are developed with ethical frameworks in mind, similar to those developed in other research areas. As one participant stated, "We, as open-source researchers, also do have ethics. So, if we look at it from the perspective of the ethics, if we don't have gender lens, that also means that our research [can be] perceived as discriminatory because we don't give equal or deserved space to learn or to gender crimes if we are investigating them."

[2] Notably, as of the time of writing, an SOP is in development as part of the Murad Code Project, a global, consultative initiative that aims to build and support a community of best practices for, with, and concerning survivors of systematic and conflict-related sexual violence.

6 DISCUSSION

6.1 SUMMARY OF FINDINGS & RESULT SIGNIFICANCE

This study affirms that while practitioners frequently describe open-source research as decentralised, innovative, and inclusive, it still mirrors some systemic inequities found in traditional research fields. The findings highlight ongoing gender disparities, geographic exclusions, algorithmic bias, and limited institutional infrastructure for ethical and inclusive research practices. However, participants described the field as offering unique opportunities for women, researchers in global majority countries, and non-traditional practitioners to contribute meaningfully. This interplay between promise and exclusion defines the current state of the field.

The study reinforces that open-source research is shaped by the data it gathers and the structures, technologies, and cultural assumptions guiding its research. Gender and geography emerged as powerful determinants of who participates in research, whose experiences are captured as data, how data is interpreted, and who has the institutional power to shape investigative priorities. This trend emerged during the analysis of the participant transcripts, with respondents from the US and Europe expressing more optimism about the field than those from global majority countries. While not a definitive finding, this difference may reflect the broader structural limitations and geographical access barriers discussed elsewhere in the study.

As a result, this research highlights both barriers and bright spots, with tension between the two poles. The near-universal recognition among participants that gender-diverse teams enhance research quality is particularly significant, suggesting momentum within the field toward more inclusive practices. The findings indicate that open-source research has the potential to be more inclusive and representative than traditional fields; however, this potential is not self-executing—it must be intentionally pursued. Incorporating feminist methodologies, increasing ethical and reflexive training, and recognising the importance of cultural and linguistic expertise are critical next steps.

6.2 COMPARISON WITH EXISTING RESEARCH

The findings substantiate key concerns raised in the literature. As Harding (1991) and Crenshaw (1989) argue, knowledge is socially situated, and failure to incorporate diverse standpoints leads to skewed epistemologies. This study's participants confirmed the literature's critique that open-source research—like other security and tech-based fields—is often shaped by male-dominated systems (Noble, 2018; Benjamin, 2019). The lack of representation and gender-sensitive methodologies aligns with Ivens and Dyer (2020), who note that open-source research often overlooks gendered violence and replicates patterns of exclusion found in security, intelligence, and journalism spaces. Moreover, the findings echo D'Ignazio and Klein (2020) and

Onuoha (2022) by demonstrating how algorithmic bias deprioritises gendered threats and shapes data visibility.

While space constraints necessarily limited the literature reviewed in this study, the findings align with a broader body of scholarship highlighting the challenges of applying a gender lens within traditional research paradigms. This further reinforces the argument that feminist and intersectional approaches are essential to improving research depth, ethics, and accuracy—insights that can be extrapolated to the open-source research field.

6.3 LIMITATIONS

A notable challenge during the research process was the difficulty recruiting male participants. Despite broad outreach, 99% of responses to the study's open call came from women, suggesting a broader perception that gender-focused research is primarily intended for female audiences. As a result, male perspectives had to be intentionally sought through targeted outreach to male researchers. Further follow-up conversations within CIR about these challenges revealed a level of discomfort among some men about joining gender discussions—not because they do not see its importance but because they worry about their right to be there or that their experiences and views are not as relevant. This trend highlights the need for the open-source research community to more clearly articulate that gender is an inclusive concept relevant to all individuals, not just women. It also reflects broader disciplinary norms where gender is often misinterpreted as outside the remit of male practitioners. If we expect the community of practice to change, finding ways to ensure men are part of the conversation is vital.

An additional limitation was related to the study's general methodological approach, which drew on key informant interviews and focus group discussions, prioritising the depth of participant perspectives over generalisation across the entire open-source field. While the sample was diverse, it was not comprehensive, and self-selection bias may have influenced participation. Furthermore, reliance on self-reported data introduces the possibility of personal bias and recall limitations. Nonetheless, the consistency of themes across respondents supports a substantial degree of internal validity.

6.4 FUTURE RESEARCH

Future studies should investigate how gendered dynamics manifest across different regions and subfields of open-source research, including cybersecurity, human rights, and investigative journalism. Quantitative research could help assess the extent of underrepresentation and the impact of algorithmic bias on data collection outcomes. Further study is needed to understand how training in ethics, cultural competence, and gender sensitivity could improve research outputs and institutional practices. Moreover, as the current geopolitical climate shifts away from humanitarian and

development spaces towards securitisation, future research may be warranted to understand the impact of this shift on inclusion in the open-source research field. Similarly, as funding priorities change, more research may be needed to better understand how donor expectations shape investigative priorities and how organisations can better advocate for inclusive research agendas.

7 CONCLUSION

This study confirms that while open-source research is often viewed as a democratised and accessible alternative to traditional intelligence and investigative work, it continues to reflect entrenched gendered, geographic, and institutional hierarchies. Disparities in access to tools, leadership opportunities, funding, and training remain especially pronounced for women and researchers from global majority countries. However, participants expressed optimism about the field's potential to serve as a more inclusive and responsive research space, reflecting the tension between opportunity and equality. Both male and female participants agreed that gender-diverse teams improve analytical depth and overall research quality, underscoring a growing recognition that inclusive approaches are essential for robust investigative outcomes.

To live up to its transformative promise, open-source research must adopt inclusive policies, reimagine what constitutes expertise, and build institutional cultures that promote accountability. Investing in more inclusive tools, training, and leadership is not just a matter of ethics—it directly enhances the quality, accuracy, and relevance of open-source investigations writ large. In doing so, the field can move beyond replicating exclusionary practices and become a leading example of what inclusive, equitable, and high-quality research can look like.

8 RECOMMENDATIONS

This section differentiates between structural and operational barriers to facilitate the implementation of the recommendations. Structural barriers encompass embedded systems of power, exclusion, and inequality that influence access and authority within the field. Operational barriers refer to challenges that can be more readily addressed through adjustments to training, tools, practices, and organisational policies.

The recommendations are not intended to be sequential; they are intended to be implemented in tandem. Structural changes require long-term, systemic engagement, while operational improvements can build institutional momentum and readiness for in-depth reform.

8.1 STRUCTURAL BARRIERS AND RECOMMENDATIONS

1. **Address gendered and geographic exclusion in leadership and funding structures**

   Prioritise structural reform of hiring, promotion, and funding mechanisms to ensure the representation of women and non-Western practitioners in decision-making roles. Furthermore, funders should require grantees to demonstrate how they actively promote diversity and inclusion within their projects and institutions. However, this study stops short of recommending that diversity and inclusion metrics be mandated as a condition for funding. While such metrics can be useful, they may unfairly disadvantage smaller organisations which are needed in this field. Instead, a more effective and equitable approach may require fundees to transparently report on the concrete steps they take to foster inclusive practices, recognising that context, scale, and structure vary across institutions.

2. **Reframe the concept of 'expertise' to include lived experience and non-traditional career paths**

   Expand definitions of expertise to include cultural, linguistic, and regional knowledge, which is often lacking in Western open-source research organisations. Institutions should validate diverse forms of contribution to open-source research, particularly those not tied to Western academic or security sector credentials. This is critical because common hiring barriers are often related to 1) funders requiring traditional metrics linked to the number of years of experience needed to qualify for a research role and 2) the requirement for security clearances, something only provided to Western analysts who have already worked in the security sector. These caveats often unnecessarily limit the ability of talented people to get into the open-source field and make it more difficult for organisations to hire researchers with the contextual and language experience required to conduct comprehensive and relevant investigations.

3. **Confront algorithmic bias embedded in research tools**

   Fund the development of alternative, gender- and culturally sensitive technologies and encourage diverse development teams. Auditing tools for algorithmic bias should be routine and required. This means that organisations using AI or automated tools to conduct open-source research should regularly examine those tools for embedded inequalities related to factors such as gender and race. In theory, this may involve testing how algorithms perform across different demographic groups, evaluating training data for skewed representation, and identifying patterns where certain types of violence or actors are consistently deprioritised. In practice, this could involve soliciting periodic reviews from third parties, developing internal audit protocols, or conducting bias impact

assessments before deploying the tool.[3] The goal is to ensure that the technology used in investigations does not inadvertently reproduce the very power imbalances open-source research seeks to challenge.

4. **Advocate for intersectional approaches in funding and research design**

   Funders may need additional encouragement to support investigations into GBV, online harassment, reproductive rights, and other underfunded areas. Conversely, the onus is also on organisations to proactively propose intersectional investigations that centre marginalised voices. Promoting a gender or intersectional lens is not just about funders or just about implementers—there needs to be a feedback loop between the two to ensure lesser-researched issues are brought to the forefront.

5. **Shift away from tokenistic inclusion toward equitable power-sharing**

   The field must move beyond representational metrics by giving underrepresented researchers control over research design, authorship, and dissemination. Representation must include power. Funders and organisations must also share responsibility for the risks associated with elevating more diverse and potentially challenging viewpoints. While funders may not explicitly limit critical or politically sensitive research, self-censorship often emerges when organisations fear jeopardising funding relationships. Enabling equitable participation requires a collaborative approach to risk—one in which funders actively support and protect research that challenges dominant narratives rather than leaving organisations to manage potential backlash alone.

8.2 OPERATIONAL BARRIERS AND RECOMMENDATIONS

1. **Develop and implement gender-sensitive research frameworks and policies**

   Develop internal protocols incorporating a gender lens into all research projects, including guidance on identifying and analysing gendered security threats and influence campaigns. However, these protocols cannot simply be about checking boxes or the tokenistic inclusion referenced above. A key challenge lies in confronting elements of open-source research culture that stem from a deliberate rejection of the structural constraints associated with traditional research. While this rejection often reflects a desire for greater flexibility and democratisation, it can inadvertently cause harm. Without established frameworks or research plans to identify and address gender bias or demographic exclusion, the risk is that research outputs will be less ethical and inclusive.

[3] For more information about what this may look like, Multistate.ai provides some guidance - The Role of Impact Assessments in Combating AI Biases

2. **Standardise ethics and safety training**

   Develop and implement standard operating procedures (SOPs) for ethics and safety across all stages of open-source research. These protocols should include guidance on informed consent, the protection of vulnerable and marginalised groups, and the responsible handling of sensitive content, particularly where GBV is present or suspected. Researchers should also be trained to critically reflect on their own identities and assumptions (i.e., positionality), recognising how these may influence the research process and its outcomes. However, given the rapid pace of change in the open-source field, ethics training must be ongoing, adaptive, and context-specific to respond to changes in platforms, risks, and investigative methodologies. Researchers need to remember that the focus should not be solely on obtaining the story or the data.

3. **Resource long-term capacity, not just short-term outputs**

   Donors should allocate dedicated funding and sufficient time for organisations to invest in inclusive research practices, ethical infrastructure, and team development—not just immediate investigative outputs. While speed and cost-effectiveness are often prioritised, quality, safety, and diversity require sustained investment. Funders should recognise that building capacity in areas such as ethics, reflexivity, inclusion, and community engagement improves the rigour and relevance of open-source investigations over time and should be treated as core—not peripheral—components of project delivery.

4. **Expand training on cultural competence and coded language**

   There is a need to develop comprehensive training modules that enhance researchers' understanding of cultural norms and regionally specific linguistic nuances and communication patterns. These should include glossaries of coded and red-flag language used in contexts involving violence, trauma, or repression. Case-based learning materials should also be developed to illustrate how a lack of cultural fluency can result in analytical blind spots or harm to individuals and communities. This type of training is particularly critical for researchers looking at conflict and war, where under-recognised indicators of harm are often embedded in culturally specific terminology or imagery.

5. **Increase capacity building and mentorship support**

   The open-source field is innovative, partly due to the inclusion of talented yet younger researchers who would benefit from capacity-building and mentorship support. As such, it will be important for organisations and funders to invest in long-term capacity-building initiatives that prioritise sustained, peer-based mentorship and support, especially for early-career and independent researchers in under-resourced or high-risk environments. These models should promote horizontal learning and cross-regional collaboration, creating opportunities for skill

development in open-source tools, ethics, and investigative best practices. Capacity-building efforts should include technical training and leadership development to address some of the structural concerns identified in this study. When done effectively, mentorship can be approached as a strategic mechanism to support retention, foster inclusion, and build resilient research ecosystems globally.

6. **Enhance digital safety protocols**

   Digital safety protocols are a must in this space. Researchers—especially women, LGBTQ+ individuals, and global majority practitioners—should be equipped with tools and knowledge for digital self-protection against online harassment and surveillance. This is about more than simply ensuring researchers know the resources are available; it should be approached with a real-world appreciation for the risks researchers take in less-stable contexts. Plans should be established to clearly outline the risks involved in specific research projects and the steps researchers can expect organisations and funders to take if their safety is compromised online or in physical spaces.

7. **Promote reflexivity as a research standard**

   Reflexivity—critically examining one's identity, assumptions, and power within the research process—is a well-established component of traditional academic research, particularly within the social sciences and feminist methodologies. It is often embedded in research design coursework, ethics reviews, and institutional protocols to ensure researchers know how their worldviews and experiences influence their research approach. Despite its importance, this study finds that reflexivity is often overlooked in open-source investigations due to its fast-paced nature and decentralised structures. To address this, organisations should integrate reflexivity throughout the project lifecycle—starting with research design and continuing through team discussions, data analysis, and reporting. Encouraging researchers to examine their own biases and ethical responsibilities enhances analytical depth and strengthens accountability, particularly in politically sensitive or cross-cultural investigations.

8. **Strengthen partnerships with affected communities**

   Wherever possible, there should be a focus on working with—not on—communities by involving local researchers in all stages of the investigation process. This includes co-developing research questions, ensuring findings reflect local priorities, and respecting community ownership of data and narratives. Efforts should be made to avoid extractive or colonial approaches, which is essential to building ethical, contextually grounded research. Long-term partnerships with local researchers and communities will also play a crucial role, particularly in helping researchers remember that real people are on the other

side of the platform data they collect. Relationships and partnerships will go a long way towards ensuring that sterile data and numbers can be contextualised with real-world narratives.

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