Social Science & Medicine 291 (2021) 114487

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed

# The role of social cohesion in the implementation and coverage of a mass drug administration trial for malaria control in the Gambia: An in-depth comparison of two intervention villages

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ARTICLE INFO

*Keywords:*
Social cohesion
Mass drug administration
Participation
Malaria
Bioethics

ABSTRACT

Mass drug administration (MDA), used increasingly in malaria eradication efforts, involves administering medication to an entire target population regardless of individual-level disease status. This strategy requires high levels of coverage and compliance. Previous studies have assessed individual and structural factors affecting MDA coverage, but there is a need to better understand the influence and expressions of community dynamics and social structures, such as social cohesion. We conducted a social science study concurrent to an MDA clinical trial for malaria control in The Gambia; ethnographic research was conducted prior to, throughout, and between MDA implementation July–November 2018, January–March 2019, and July–November 2019. We assessed how social cohesion, as expressed by the trial population, affects trial coverage through an in-depth ethnographic analysis of two trial villages, using observations, interviews, and focus group discussions with community members who took the trial medication and those who did not. We found that the villages had unique expressions of social cohesion. This was reflected through community participation in the trial implementation and may have affected coverage and compliance. The village with low coverage expressed a form of social cohesion where members followed advice to participate through a hierarchal system but did not actively participate in the MDA or its implementation. The village with high coverage expressed social cohesion as more participatory: individuals took the directive to participate but contextualized the trial implementation to their needs and wants. We analyze these different expressions of social cohesion and the important differences they make for the coverage and compliance levels reached in the two different villages.

## 1. Introduction

Mass drug administration (MDA) has been used for the reduction and elimination of multiple neglected tropical diseases and is increasingly being used in malaria eradication efforts (World Health Organization, 2017; Poirot et al., 2013; Webster et al., 2014). This strategy involves the administration of medication to an entire target population regardless of individual-level disease status. Computer models suggest that a minimum coverage – in this case, the percent of targeted individuals who complete the MDA drug regimen – of at least 80% must be reached to achieve the desired clinical and epidemiological outcomes (Newby et al., 2015). Achieving high coverage is also an ethical necessity, as it is required to ensure that the benefits of the MDA are greater than any risks associated with the medication (Cheah and White, 2016). Multiple studies have been conducted to better understand the causes of high or low coverage across many geographical contexts, particularly Southeast Asia and sub-Saharan Africa (Atkinson et al., 2011; Adhikari et al., 2016). With respect to low coverage, findings have shown that

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https://doi.org/10.1016/j.socscimed.2021.114487
Received 8 March 2021; Received in revised form 11 October 2021; Accepted 12 October 2021
Available online 13 October 2021

people are less likely to comply to MDA when its timing overlaps with harvesting season or a time of high mobility (Dierickx et al., 2016); when there are concerns about the potential side effects of the medication(s) (Pell et al., 2019); when there is a lack of acceptance to taking medication, especially when asymptomatic (Adhikari et al., 2016; Jaiteh et al., 2019); or where there is a reluctance to undergo screening procedures such as pregnancy tests (Dierickx et al., 2016; Fehr et al., 2021). Conversely, since many MDAs take place in low-resource settings, it has been well established that people are more apt to enroll and comply in clinical trials when there are additional benefits to participation, such as ancillary medical care or financial or material incentives (Atkinson et al., 2011; Adhikari et al., 2016, 2018; Mfutso-Bengo et al., 2008; Kingori, 2015). There is also evidence that the socio-political environment and social and familial relationships have a great impact on enrollment and compliance (Fehr et al., 2021; Adhikari et al., 2018).

These studies, however, do not thoroughly elaborate on the ways in which - or how - community dynamics and social structures affect trial coverage and compliance. Particularly relevant in this setting is the community dynamic of social cohesion, "a state of affairs concerning both the vertical and the horizontal interactions among members of society as characterized by a set of attitudes and norms that includes trust, a sense of belonging and the willingness to participate and help, as well as their behavioral manifestations." (Chan et al., 2006) A systematic review found that all definitions of social cohesion contain three main components: 1. The relations and social networks between people, 2. The sense of belonging and attachment of people to a particular group, and 3. A common orientation towards the "common good." (Schiefer and Noll, 2017) Additionally, when speaking of requirements for social cohesion based on work in South Africa, Burns, et al. (Burns, Lefko-everett, Njozela; Burns, Hull, Lefko-everett, Njozela) state that an African social cohesion must include five elements: 1. A feeling of belonging, 2. Cooperation within the group, 3. Institutional trust, 4. Social and kin relationships, and 5. A shared identity. Though the literature regarding health and social cohesion is limited, particularly within sub-Saharan Africa, some studies have shown that social cohesion may help improve an individual's health status and lead to a more successful implementation of global health projects (Pronyk et al., 2008; Lippman et al., 2018) Yet, much like many of the decision-making models regarding coverage, these studies were focused on the individual level and did not assess the larger impacts of social cohesion at the community level (Lippman et al., 2018).

In The Gambia, political, familial/kinship and social relationships, as well as a sense of belonging, impact the acceptance, implementation, and success of clinical trials (Fehr et al., 2021; Leach et al., 2011; Geissler et al., 2008; Jaiteh et al., 2016). These relationships also influence individual decision making and may lead to social pressure (Fehr et al., 2021). Further, though it is often considered an important part of successful and ethical global health research (Emanuel et al., 2004; Organizations and Sciences, 2016), and may increase MDA coverage, the consequential social pressure from community engagement activities may actually coerce individuals to participate in a clinical trial and, therefore, undermine ethical research practices (Nyirenda et al., 2020; Fisher and Fisher, 2020). Some of this social pressure may stem from those in positions of leadership who are traditionally incorporated into community engagement activities (Tindana et al., 2011). Due to their positions of power within communities, village leaders may apply pressure to their community members to participate, which may lead to structural coercion (Nyirenda et al., 2020; Fisher and Fisher, 2020). Strong social pressure to comply with research has been shown in the literature regarding community engagement (Nyirenda et al., 2020), but little is known on how social pressure stemming from social cohesion may affect research participation and overall MDA coverage.

"Participation" has become increasingly proceduralized and pervasive in medical (and other) contexts, decreasing its power as a concept (Kelty, 2020). Rather than enacting another critique on participation, it may be more beneficial to explore the novel understandings that connect to conceptual strands embedded within the communities themselves. Relatedly, as Global Health as a discipline begins efforts to decolonize its practice and research (Büyüm et al., 2020), it is imperative to increase global epistemic justice (Chimakonam, 2017) and recognize the importance of communities' internal logics in creating models of participation in clinical trials, particularly as they relate to the underlying social dynamics of trial communities (Geissler and Molyneux, 2011). Besides paying attention to the neocolonial consequences of efforts to achieve diverse inclusion in clinical trials (Epstein, 2007), increasing importance is given to mobilizing non-Western conceptual approaches and epistemologies (de Sousa Santos, 2014) in global health scholarship. Using a lens of African philosophy concerning communitarianism could be particularly important here, given its wide-ranging societal consequences and importance across much of sub-Saharan Africa. Therefore, the purpose of this study is to understand how villages' enactments of social cohesion elicit specific forms of community participation that may impact MDA coverage. We do so by conducting an in-depth comparison of two trial villages with vast differences in coverage during an MDA trial in The Gambia.

## 2. Methods

### 2.1. Study design, data collection and analysis

#### 2.1.1. The MASSIV trial and social science research

This study is part of a larger social science study that took place concurrently to the "Mass drug administration of ivermectin and dihydroartemisinin-piperaquine as an additional intervention for malaria elimination (MASSIV)" trial (clinicaltrials.gov, NCT03576313). MASSIV was a Phase III, community-based, cluster-randomized control trial testing the efficacy of MDA with dihydroartemisinin-piperaquine and ivermectin on interrupting the transmission of malaria in the Upper River Region of The Gambia. It was conducted by the Medical Research Council Unit The Gambia (MRC-Gambia) and took place in 32 villages (16 control and 16 intervention). The overall targeted population in the intervention villages was approximately 5400. MDA medication was distributed each month from August–October 2018 and July–September 2019 (Dabira et al., 2020).

The social science study was a mixed-methods ethnographic study focused on understanding the acceptability, coverage, and compliance of MASSIV. In-depth interviews (IDIs), informal conversations, and focus group discussions (FGDs) were conducted among trial participants, trial decliners, village leaders, and trial field staff. In total, 210 IDIs and 29 FGDs were conducted in the periods of July–November 2018, January–March 2019, and July–November 2019.

This paper focuses on two specific trial intervention villages. During the first year of the trial (2018), we noticed two villages with substantially different levels of coverage. Upon further investigation, we noticed that they also had unique social dynamics that seemed to influence the populations' involvement with the trial. Therefore, for the second year of the MDA (2019), the social science study theoretically chose these two villages for further research to understand how social dynamics impact trial coverage in both a high- and low-coverage village (Willems et al., 2001). We conducted additional ethnographic research around the time of the MDA, and lived in each village; we observed and participated in the daily lives of the villages' inhabitants during both times of MDA medication distribution and times without any MDA activities. As part of this, the social science team compiled extensive structured and non-structured observational field notes that were discussed and reflected on regularly. Additional IDIs, informal conversations, and FGDs were held with individuals and groups purposefully selected to represent all opinions and include those who took or did not take the trial medication. Several respondents were interviewed multiple times and regular reflexive discussions were held with the social science team in the field and abroad.

Analysis was a continuous, flexible, and iterative process designed to

ensure a thorough understanding of emerging themes and definitions of concepts until saturation was reached. We began by researching social dynamics from a broader perspective, but during our ethnographic work, we came to understand that *social cohesion* was the specific social dynamic with the greatest importance to our study. Therefore, we proceeded to focus on it specifically as we continued our research process. The team in the field included three Gambians from the local area (but not the actual trial villages), two of whom are Fula and one of whom is Mandinka (though all three were fluent in both languages). These team members were intricately involved in all discussions on the emergence and development of relevant themes, especially on how the terms and questions to respondents related to and on social cohesion were defined, translated, and used throughout data collection methods and analysis. Lastly, all IDIs and FGDs were recorded and transcribed and translated verbatim with the aid of trained field workers. Qualitative data were analyzed with the use of NVIVO v12 software.

### 2.2. Study setting

The trial population is located in a rural area of the Upper River Region, The Gambia, a region with highly-seasonal malaria transmission patterns. It is an area of low mosquito vector density, but high vector survival. This indicates that there are groups of mosquitoes not killed by traditional vector control, and makes the area ideal for the implementation of MDA. Further, despite reported use of other control methods (e.g. long-lasting insecticidal nets, indoor residual spraying, etc.), the Upper River Region maintains the highest rate of malaria in The Gambia (Mwesigwa et al., 2017).

Trial villages ranged in size from 140 to 700 people. Each village is headed by the Alkalo, the village chief, who most often inherits his role following the male-line of succession from the founder of the village. Each village also has a council of elders. Though the Alkalo has the final say in village matters, the elders represent another form of political authority and are involved in village decision-making. Villages are further divided into compounds. Each compound is led by the compound head, the oldest male, and is comprised of his family and those of his eldest sons or younger brothers; polygamy is actively practiced. The population practices Islam and each village has a mosque or designated place to pray and study the Quran. The primary economic activity in the area is subsistence farming. Villages are often located a prohibitive distance from the main paved road and the difficulties and costs of transportation were often cited as a limitation in accessing health care services. Community-level social cohesion is enacted in specific physical and organizational spaces. The first of these is the village bantaba. A bantaba is a shared communal space maintained by the whole village. It is a place for the village to gather for formal meetings and for people to gather informally for regular social interactions. Similarly, all villages in the region have three principal community groups: the Village Development Council, the Women's Group, and the Youth Group. These groups are involved in making decisions regarding the functioning of the village, as well as carrying out economic and other activities, such as village cleaning and social events. Further details on the two study villages are found in the Results section.

### 2.3. Ethics

All components of this study were approved by the Institutional Review Board of the Institute of Tropical Medicine in Antwerp, Belgium and the Scientific Coordinating Committee and Ethics Review Board of the Medical Research Council Unit The Gambia. All participants provided verbal informed consent or assent (when under 18) prior to participation in any component of the research.

## 3. Results

Our results focus on two main components: 1. Enactments of social cohesion in the two study villages, and 2. How local expressions of social cohesion and dissent are reflected in the villages' involvement with the MDA implementation.

### 3.1. Enactments of social cohesion

Ethnographic research revealed unique attributes in each village that either influenced, or were influenced by, the types of social cohesion found within them. Definitions of social cohesion were initially found to be similar in both Village A and Village B. The Fula words used in Village A, *kongol gotol*, mean "same voice." And in Village B, the Mandinka word used for social cohesion, *Kangbengo*, means "people who speak the same voice; come to agreement." Social cohesion was described as when the whole community comes together to make a joint decision. Respondents in both villages reported that social cohesion was present before anyone in the village was born – it was passed down to them from their ancestors – and that this social cohesion stemmed from the fact that all members of the village were descendants of the same family. The most common reason given as to why village social cohesion is so important is because social cohesion is the mechanism through which good things happen to the village. In addition to more abstract notions such as group harmony, this could also mean very specific village development projects, such as access to electricity, water, or better roads.

> "This is something we have inherited from our great grandparents; we are one people born from the same village. This social cohesion has been existing in this village since when we were not yet born, and it will continue like that."
>
> Adult female, Village B, FGD

Though Village A and Village B had similar definitions of social cohesion, there were stark differences in the ways in which this was enacted through the way the villages were organized, understood leadership, and expressed dissent in public spaces.

#### 3.1.1. Social organization and leadership

*3.1.1.1. Village A.* At the time of the study, the village included 13 compounds and had a population of nearly 200, all of whom identified as part of the Fula ethnic group. The primary economic activity was farming. However, due to the village's location near the border with Senegal, several villagers, predominately young men, were also involved with supplying lumber for the illegal logging trade; this substantially added to their overall income (lumber was collected in The Gambia and moved to Senegal to be shipped abroad). In general, each family or compound in the village had their own land to farm. This land was owned by the oldest male of the family who then maintained control of any money earned through selling crops, though other men and women contributed their time and labor to the farm. Importantly, working in the lumber trade was viewed as an individual activity that increased a single person's income. In contrast, farming, the traditional economic activity, was viewed as communal and beneficial to the whole compound.

Village A did not have a village bantaba. Instead, meetings were held at the compound of either the Alkalo, the Imam, or another member of the village. People tended to socialize at one another's compounds rather than a communal space. Like all villages, Village A had the expected community groups, but we saw less of their involvement in village activities; most visible were the boys and young men who played soccer as part of the Youth Group.

The role of leaders, especially the Alkalo, is an important component of village social cohesion. The Alkalo of Village A was described as being "everyone's father," and people listened to what he had to say. In fact, many respondents stated that it was evident social cohesion exists in their village because they all follow what their authority figure tells them to do. At the village level, this means people follow the direction of the Alkalo, and at the compound level, they follow the direction of the

compound head.

> "And in this village, we all look up to the Alkalo as he is the head of the village and a parent to us. Whatever he said to us to follow we will follow it, and if he also said let us not follow something, we as a village will do exactly as he said. No one will challenge or argue about it and this line of respect to village authority will always be continued to be adhered to in our community."

Adult male, Village A, IDI

This notion was reflected in interviews, regardless of age. As one older man said, to show respect to the elders and the Alkalo is "to be under them completely." We were told members of the community are expected to obey what the elders say, and adhere to their advice, regardless of an individual's feelings about the matter. This man further explained that to go against the advice of the Alkalo or elders was not only bad for that individual, but also bad for the society. To him, going against the Alkalo or your elders was on par with disrespecting the whole community.

> "R: The way you should respect your elders, not only the Alkalo, is like whatever they assign you to do, you do it without no hesitation or complaint. You should be a good listener to them, meaning to be under them completely, but most of the time if the Alkalo or village elders give authority, and you are always opposing them, they will see it as you are disrespecting them and it is bad for the society.
>
> I: Why is it bad for the society?
>
> R: That is like if you are supposed to respect these elders and you don't respect them, it is like you disrespect the person and the community as a whole, so for that reason you are affecting yourself and you are affecting the people, and whatever good thing that is about to happen for you, people will not be very much interested about it which is going to affect you in one way or the other."

Adult male, Village A, IDI

*3.1.1.2. Village B.* The village had a population of approximately 350 individuals living in 14 compounds and nearly everyone identified as part of the Mandinka ethnic group. Village B is located near the Gambian River and, therefore, relies on fishing as an additional source of income to subsistence farming. Each compound had designated land for farming, and this land was divided into the husband's plot and the wives' plot. Though the men were typically engaged with farming foods for family consumption (e.g. coos and millet) and women were engaged with farming foods to sell (e.g. groundnuts), each was in ownership of the money their plot generated.

During FGDs and IDIs with adolescent girls, it was common for them to discuss the produce they sold and how they chose to spend their money. As part of their cultivating and money-making, women would give "charity" to their husbands when they were earning more money from their plots. The money earned by women was most often spent on the needs of the whole compound, including household goods or healthcare, but they also contributed substantially towards "feast money" that would be used for different ceremonies. Ownership of their financial means also meant that women in Village B seemed to have a greater role in compound decision making than in Village A, where the norm was for the compound head to be the principal decision maker.

> "Men cultivate coos and women cultivate groundnut. The coos is used for the family consumption and the groundnuts cultivated by women would be sold by the women and spent on feast money to buy the ingredients … When we cultivate the groundnut, we bag the groundnut and every nine bags belong to the woman, the tenth bag goes to the husband as charity to the husband. The woman decides what she wants to do with her nine bags; the husband has nothing to do with that."

Adult female, Village B, IDI

Village meetings and social gatherings were most often held at the village bantaba or the village mosque. The mosque, a source of pride in the village, was built from donations of village members living abroad. The community groups in Village B were very active and held regular meetings and events, several of which - unrelated to the MDA - took place while we stayed in the village for data collection. This included a meeting of the Youth Group focused on preparing for the next village cleaning activity.

> "That would be a very difficult community [one without active community groups] … A community must have a common goal and that is to develop the community. In the absence of these structures, it would be difficult to bring the people together to focus on development … [Without community groups], there is no social cohesion existing in that village and they would be faced with challenges they would not be able to address because they are not organized. This mosque in this village was built by the youth who travelled to Europe, this and the like can bring social cohesion to the village. In the absence of this, it would be difficult for social cohesion to exist within the community."

Adult male, Village B, IDI

The role of the Alkalo as a decision maker is important in all trial villages, as he has the final say in all village-related matters. However, the Alkalo in Village B believed that the village as a whole should make decisions together. He credited the village's success in solving problems or bringing in new development projects to their communal approach to decision making.

> "I am the Alkalo of this village, but the way and manners we operate here is this: we allow the people to lead and we follow. When villagers finally make their decision, then you can support their decision and advise them accordingly, but I would not want them to confront me for not disseminating information … I am the eldest man in this village. I have children and grandchildren in this village. The reason we are one people and speak the same voice is I allow them to lead. When I have visitors, I inform everyone about it, and we sit and discuss. Whatever you discuss with them I would comply, but I must allow my people to express their opinion first. They are my family."

Village B Alkalo, IDI

The Alkalo would frequently hold meetings at the village bantaba to elicit feedback and make decisions important to the village.

> "When projects come to a village, they first introduce the project to the village head and Village Development Chairman. Then the entire village would be informed about the project and a meeting would be organized in the village, and when the leaders accept the project, we accept too and participate."

Adult female, Village B, FGD

Another aspect of the social cohesion as expressed in Village B was the importance of an individual's active participation in the life of the village. When asked how one could tell someone is a leader or asked what qualities a leader possesses, respondents always described a leader as one who was involved in all aspects of village life:

> "Villagers respect him. Whatever activity is happening in the village, he is involved."

"She is a good leader because whatever happens in the village, she would participate. When you go to meetings at the bantaba or anywhere in the village, she would participate fully."

- Adolescent girls, Village B, describing leaders in their village during an FGD

### 3.2. Village involvement in MDA implementation

Despite fluctuations, Village A had one of the lowest rates of coverage during the first year of the trial. The village also had the largest drop in coverage between the first and second rounds of the trial's second year. Village B, on the other hand, had the highest trial coverage — nearly 100% of those eligible — of all intervention villages throughout the entire MDA. In this section, we explore how the local dynamics previously expressed are related to the communities' involvement with the MDA.

#### *3.2.1. Initial decision making, dissemination of information, and location*

The villages of the Upper River Region are accustomed to the regular implementation of MRC-Gambia programs and trials, and the introduction of MASSIV was designed as a standardized process across all trial villages. Once selected to be a part of MASSIV, MRC-Gambia field staff travelled to each village to discuss the trial with the Alkalo and get his permission for it to be conducted in that village. No selected village declined participating in MASSIV. Prior to the enrollment and informed consent of trial participants, MRC-Gambia field staff conducted sensitization meetings in each village to discuss the importance of MDA compliance, the timing of the distribution, the specifics of medicine intake, and any other trial details.

Each village, with the aid of the MRC-Gambia field team assigned to it, was able to choose the location for medicine distribution. The main requirements were that the location was available to everyone, large enough to accommodate the necessary supplies, and had shelter against the rain, wind, and sun. Furthermore, each village needed a location to conduct the pregnancy test that was required for eligibility purposes of women and girls of reproductive age. This test proved challenging. First, there were cultural issues regarding asking unmarried women to take a pregnancy test, especially by the all-male MRC-GAMBIA staff, and, second, it was difficult to ensure adequate privacy (Fehr et al., 2021).

In Village A, prior to the commencement of MASSIV, the Alkalo reported being *told* by MRC-Gambia that they would be arriving in the village to distribute malaria medications and post a nurse. He was happy they were coming, but as such, did not consider allowing MASSIV to take place in the village to necessarily be a decision. Instead, the MDA was something that would happen to the village rather than something that needed to be decided upon.

"The MRC[-Gambia] has been visiting this village for a long time now – it wasn't this year they started visiting the village. But this time they came during the dry season, and when they came, they informed us why they came to this village … They also said they were going to post a nurse in here, so since then we are waiting. They also said they will give us malaria medicine and worm medicine."

Village A Alkalo, IDI

In the same pre-trial interview, the Alkalo said that when MRC-Gambia shared the details of the MDA, he would send his son around the village to inform everyone. This is how information is typically distributed throughout the village. From that point on, the son told the village to participate. Though individual compound heads may have also told their families to take the medication, there was no additional or formal way of spreading relevant trial information. However, on the first day of the MDA, we observed a compound head, a well-known man active in the daily life of the village, voluntarily informing people that MRC-Gambia had arrived with the medication.

Because Village A did not have a central bantaba or designated mosque in a shared space, the trial medication was distributed at an individual family's compound. This compound was one of the larger ones in the village, was located at the entrance, and had a covered area for the MDA field staff. The pregnancy test was also conducted at the compound; an MRC-Gambia nurse had a small table inside, and women and girls were able to use the compound's toilet facilities behind the main house.

In Village B, the majority of the community was involved in the trial from the beginning of the implementation process. As a first step, the Alkalo and his son called a meeting with the village elders and all compound heads to discuss the details that the MRC-Gambia provided them. As a collective, the leaders decided that the entire village would benefit from the MDA and made the decision to participate as a whole.

"We accepted the MRC-Gambia because we have support from the villagers. I am the leader, but I cannot do it alone; we accepted to participate in this study because we all agreed to participate …"

Village B Alkalo, IDI

This kind of village-level decision making is common in Village B. Information regarding MASSIV was passed throughout the community in multiple ways. First, information was given at the sensitization meeting held by MRC-Gambia. Second, from the initial meeting with the Alkalo, compound heads were expected to share the trial details with their families and to emphasize the importance of participation. Third, the Women's Group was heavily involved in spreading information. In the days before each round of the MDA, they moved throughout the village and performed songs and dances that provided the village with details of the trial. The MDA in Village B was held at the mosque. It was centrally located and contained large open and covered spaces. The pregnancy tests were conducted and read at a neighboring compound away from the medication distribution site.

#### *3.2.2. Involvement of community groups and individuals*

Having active community groups working for the same goals was not only important for the success of the MDA, but was a central component of the overall social cohesion within the villages. The trial protocol included directions for involving an impartial witness in each village to be present during the informed consent process, but did not include any formal methods of community engagement. As such, the involvement of individuals, including the Alkalo, or the community groups in the implementation of the MDA varied from village-to-village.

Due to his health status, the Alkalo of Village A was not eligible to take the trial medication, and he was not involved in the trial activities unless it was specifically requested. For example, after an initially low turnout during one round, the MRC-Gambia field team appealed to the Alkalo to use his power and position to encourage those in the village to take the medication. At their request, the Alkalo called an impromptu meeting on his compound and reiterated the importance of compliance to the MDA. Immediately after, there was an increase in people at the MDA site taking the medication. The Women's Group also came to the MDA site and performed songs and dances to encourage people to attend and to provide a fun atmosphere. Though some girls told us they would mobilize their peers from their own compounds, neither the Village A Youth Group nor individual youths were involved in MASSIV's implementation. As one teenage girl noted:

[Regarding mobilizing others in the village] "Simply because we are young, and this is a function of the elders. So whatever directives the elders give us, we do that accordingly."

Adolescent girl, village A, FGD

To our knowledge, the implementation details of the MDA were not

discussed in communal spaces during or after implementation. Therefore, for the most part, the MDA was carried out as proposed and decided upon by the MRC-Gambia field team.

In contrast, the community groups in Village B, already very active in village activities, played a visible role in the trial's implementation. In addition to spreading information, the Women's Group came together and decided to conduct the pregnancy tests themselves. The Traditional Birth Attendant and her assistant were trained by the MRC-Gambia field nurse on how to properly perform the test, and they decided to conduct it away from the MDA site. In this way, women and girls were able to be tested for pregnancy by trusted women from their village, without having to risk showing their urine or the results of the test to others at the MDA site. The Youth Group was also heavily involved. Prior to the distribution of medication, they were responsible for cleaning the MDA site and setting up the tables and chairs for the trial team. During the MDA, youth would go around the village or out to the farms to help mobilize those who had not yet taken the medication. Additionally, the Village B Alkalo's son was an active coordinator and advocate for the trial. He was involved in the communication between the village and the MRC-Gambia trial staff, mobilized village members, was present at the distribution site throughout the duration of the trial, and helped the MRC-Gambia team with anything they needed.

### 3.2.3. Social pressure and expressing dissent

Social pressure — especially to follow the overall decision of the village — was present in both Village A and Village B and affected individuals of all ages and genders. In interviews, respondents explained the consequences of someone going against the group decision. This was looked down upon in both villages and was also considered a sign that the social cohesion was "not strong." When an individual did go against the group decision, villagers, often led by the Alkalo, would try and "bring back" the person to the community.

> "People will view that person [who went against the group decision] as an individual who is not good, because if you are asked to participate in something that the whole village agreed to and you disagree to that, people will not see you as a good person … Going against the decision of the entire village is bad. When you were born, people washed you and took care of you, and when you die, people will take care of your body and bury you."
>
> Adult female, Village A, IDI

Often, those who refused to participate (excluding those with justifiable reasons, such as traveling or illness) were described by respondents as "selfish," "stubborn," or "disrespectful" because they did not follow their elders' advice. If an individual was not interested in participating in the MDA, a decision the village made as a group, then it was important that their reason was deemed acceptable to the rest of the village. In Village A, adolescent girls spoke of the social pressure they experience from their village and apply to their own peer group. The girls described that when together, they like to give each other advice, which is often related to how they should act towards their parents and elders. If the girls do not adhere to the advice of their friends, the friends will discontinue their friendship with the girl in question:

> R1: "The village elders will not be happy for her if the girl is not respectful to her parents and elders of the community … nothing good will follow her … What is going to happen in that situation is that I will advise my friend to stop disrespecting her parents; if she doesn't abide by it, I will stop moving with her because I will know that she is not a good friend."
>
> I: "Why is it that you will stop befriending a person who is not respectful to her parents?"
>
> R2: "Because we don't want people in the village to classify us under the same category, because if they see us moving with this disrespectful girl others might think that we are all having the same habit."
>
> Adolescent girls, Village A, FGD

This is particularly relevant to trial compliance. Across all trial villages, girls were both perceived by the community and shown in the clinical data to have taken the medication significantly more than boys. When asked why this was the case, respondents said it is because girls "respect their parents more" than boys. As part of showing respect, girls are more likely to obey the requests of their parents and elders when told to take the trial medication. Though other reasons included "being healthy" and "absent for work," "disobedience" was emphasized as the main reason for boys' lower compliance.

Unique to Village A was that several people, mostly women and girls, said they had or feared having epilepsy, which would make them ineligible for MASSIV. This was not found in any other trial village, and, according to MRC-Gambia medical staff, the diagnostic capabilities required to confirm the illness did not exist in the broader area. The illness was described to us as having two causes: one biological and present since birth, and the other spiritual and related to not having a "clean heart." Due to gender-specific roles, men and boys were able to invoke farming or traveling as an acceptable way of evading the MDA. Conversely, the principal responsibilities of women and girls were on the compounds, which made their whereabouts and actions more easily monitored. By claiming epilepsy, women and girls may have been providing an "acceptable" way to decline participation in the MDA without having to go against the communal decision. In this way, they did not have to take the medication, but they were still not viewed by their community as a "bad" person.

In Village B, social cohesion was also linked to the leadership of the compound heads and to the strength of their compounds. One way compound heads could demonstrate their strong leadership abilities was by having their entire compound fully adhere to the MDA. This produced social pressure on the compound heads. As such, some explained that they made it a point to take the medication in the morning and then wait in their compound (before heading to their farms) until they knew all their family members had taken the medication. In addition to proving that the social cohesion in his compound was "strong," the ability to lead within one's compound was relevant when that man may want to take on a leadership role within the village.

> "Every compound head in the village tells their family, 'if you hear anything that will bring development to the village, you become the first to participate.' Any activity here, each compound head wants their compound to participate, and this is something they are very proud of. If a compound does not get involved, [the compound head] loses respect and they are not allowed to talk in village meetings. Because they cannot control their families, they have no say here."
>
> Adult male, Village B, IDI

Dissent in both Villages A and B, however, was not "all-or-nothing," and room for acceptance of individual opinions and decisions did exist. But even with this nuance, there was still a focus on the importance of rejoining the community. As one man explained:

> "Well those people will just be seen as how they behave, because you know people are different - some people like to share and some people doesn't, but that doesn't mean they should be isolated, as some people like community work but others don't, so in this situation, if they don't agree to the Alkalo's decision and the majority of the community, as time goes on, if they see any benefit, if they are convinced, they might join the majority of the village to participate in whatever activity that is ongoing in the village."

Adult man, Village A, IDI

## 4. Discussion

This study has sought to identify local enactments of social cohesion and the relationship to community participation in the implementation of an MDA trial in The Gambia. After identifying and theoretically selecting two villages with unique social dynamics (later specified to social cohesion) and drastically different coverage rates in the first year of the MDA trial, this study builds on previous findings that show social, not just individual, factors are intrinsically important to understanding high and low MDA coverage and compliance (Fehr et al., 2021).

Both study villages expressed their forms of social cohesion through their unique involvement in the MDA. We believe these expressions of social cohesion can be elaborated on and understood through the lens of African communitarian discourse, of which social cohesion is a core value (Chuwa, 2014). Most familiarly referred to as Ubuntu, multiple variations and definitions of African communitarianism exist, and its principal components can be found throughout much of sub-Saharan Africa (Ramose, 1999; Eze and Eze, 2013; Louw, 2009; Gade, 2013). At its core are concepts of solidarity, reciprocity, and of understanding oneself through relationships with others and one's community (Mkhize and Nicolson, 2008; Sambala et al., 2020). Participation in society is also a key component. According to Shutte (1993) as stated in Louw et al. (2006), communitarianism unites the individual in a "particular web of reciprocal relations" where "I think, therefore I am," is substituted for "I participate, therefore I am." (Shutte, 1993; Louw et al., 2006) (p168) For the sake of the community, individuals have a moral responsibility to participate in the rituals, norms, and traditions that contribute to the community. Respecting one's elders and place in the social hierarchy is a component of this (Chuwa, 2014). Further, there is a long-standing philosophical debate on the extent to which an individual exists in relation to their community. Some believe that the individual does not and cannot exist without the community (Menkiti and Wright, 1984; Mbiti, 1969; Gyekye et al., 1998, Menkiti and Wright, 1984; Mbiti, 1969; Gyekye et al., 1998), and that all members must come to a common consensus and agreement. Others, on the other hand, have argued that this can result in hyper social pressure and may lead to "promoting groupthink and uncompromising majoritarianism." (Metz, 2010).

Part of Village A's expression of social cohesion was the importance of respecting the authority of the Alkalo, to be "under him completely." The initial agreement to participate in the MDA trial was initiated by the Alkalo and those in the village were expected to follow the hierarchal decision-making process. This created pressure to comply and potentially lead to structural coercion (Nyirenda et al., 2020). In fact, the importance of power dynamics in certain contexts, such as The Gambia, have been recognized as so strong and influential, that some have suggested limiting the role of authority figures in trial implementation (Adhikari et al., 2020). In this light, it is possible that the social pressure to partake in the MDA may have been great enough to lead to such reasons for declining as potentially having epilepsy (especially among women and girls).

In Village B, social cohesion was expressed in a way that not only the Alkalo, but all village leaders, were active participants in every component of village life. Those in Village B also reflected a communitarian view of working towards the benefit of the whole group, but the social cohesion of the village was not a result of the leadership of one man. Instead, the active participation expected of all leaders was a result of the type of social cohesion expressed in this village. Further, social cohesion in Village B was expressed through the active participation of all community members throughout the MDA implementation. Participation in a trial and compliance to the medications was not a one-time activity, but a continuous process (Muela Ribera et al., 2016), and the members of Village B were involved in the trial's implementation from beginning to end. Even when describing leadership roles, Village B conveyed the importance of participation: it is not only good for the community, but it benefits the individual in that their leadership skills and strong character are recognized. Though the village was not immune to social pressure, as demonstrated by the actions of the compound heads, it is possible that Village B's expression of social cohesion was able to minimize some of the effects of structural coercion and that individuals may have been able to maintain more autonomy in the decision-making process - even while respecting the authority of the Alkalo and the decision of the village.

Active participation as part of their definitions of social cohesion greatly affected trial coverage in these villages. Community participation is often described as being "top-down" or "bottom-up," but by focusing on the expressions and logics of the respondents, this study has demonstrated that social cohesion impacts community participation in more complex ways than traditional theories have explained (Atkinson et al., 2011). Particularly in Village B, community participation was a mix of both vertical and horizontal processes. The role and power of the Alkalo is very strong, and community members showed their respect to him and to their compound heads by complying to their requests. However, the individual is respected within their role in the community, and active participation is a form of their social cohesion. Therefore, the individuals and community groups in Village B were able to modify and contextualize the MDA in a way that best suited their needs and wants. It is possible this led to greater MDA coverage.

The findings of this study expand upon the previous literature and demonstrate that social factors, especially unique forms of social cohesion at the village level, can prohibit or facilitate high MDA coverage. Additionally, this study shows that many of the individual factors used to describe MDA coverage in previous research, such as farming obligations (Dierickx et al., 2016; Adhikari et al., 2018), may, in fact, be a result of more complex social dynamics. For example, with strong social pressure resulting from a particular expression of social cohesion, being too busy with farming activities, or even having a severe illness, may in fact be a socially acceptable reason to not partake in the MDA while not outwardly going against the communal decision to participate. It is possible the option to provide an "easy out" decreased the overall social pressure to participate and may have led to the lower coverage in Village A. In contrast, social cohesion, when expressed via the approach of Village B, may also provide ways to overcome individual factors prohibiting high coverage, such as the hesitation to screen for pregnancy (Dierickx et al., 2016; Fehr et al., 2021).

### 4.1. Implications for future trials

This study has shown that participation in a trial, especially an MDA that targets the entire community, is part of a complex social system and goes beyond merely providing informed consent and taking the trial medication. People's ability and interest to "participate" are nuanced and highly influenced by the community around them and their place within it. Further, many African philosophies of communitarianism regard the decision to act in a way that "connects" or betters the community, not only as important, but the morally right thing to do. This complicates the assumptions of, and focus on, individual autonomy that proliferate in traditional research ethics and trial design. Because of this, future trials need to be aware of the potential impact they may have upon entering a community that makes it socially and morally difficult for an individual to make an autonomous decision. By demonstrating the role of social cohesion and social pressure in MDA implementation and coverage, this study has found that it is imperative for implementing organizations to move beyond the more traditional forms of community engagement and create greater, more meaningful bidirectional understanding and conversation. As part of this, it is important to understand local enactments of critical social dynamics, such as cohesion, and their particular influence on trials' implementation. In doing so, implementation can be made more community-friendly by allowing trial communities to contextualize the implementation to their needs.

Similarly, trials can be made more ethical by understanding how social forces, like social pressure, and components of structural coercion may undermine ethical practices. This may be crucial in achieving the coverage necessary for MDA to be successful.

African epistemological frameworks have been largely left out of the discourse surrounding global bioethics in favor of Western philosophies (Metz, 2010). Within philosophy, this is considered a global epistemic injustice, and there is a need to increase their use to understand trial- and health-related topics within sub-Saharan Africa (Chimakonam, 2017). African philosophy as a whole has already been used as a lens for understanding multiple disciplines in this context, such as economic development (Mosima, 2019), social work (Mugumbate and Chereni, 2020), and management practice and leadership (Guma, 2012). Additionally, there has been a growing movement to include African communitarian discourse as an alternative (to Western) ethical framework, particularly for decision making, in global bioethics and public health (Chuwa, 2014; Sambala et al., 2020; Metz, 2010; Ewuoso and Hall, 2019). This study, by assessing different expressions of social cohesion and its relation to participation, provides a small, early step in empirical application of African philosophy in global public health.

### 4.2. Limitations

This study shows the importance of locally expressed social cohesion in the implementation and success of an MDA trial. However, it is not to say that other factors may not also contribute to a trial's success. Other forms of structural coercion, such as lacking access to medical care, may also greatly impact the decision-making process (Kingori, 2015; Nyirenda et al., 2020). The role of the field nurses stationed in each intervention village also impacted implementation outcomes and their role will be the focus of future analyses.

## 5. Conclusion

Much of the prior research on MDA coverage has focused on the effects of individual and structural factors. These studies risk using a lens of interpretation from the Global North to analyze and improve MDA practices taking place in the Global South. In this study, we focus on community-level social systems as emically understood and practiced. We compared two trial villages, one with high coverage and one with low, and analyzed how their unique expressions of social cohesion influenced their involvement in an MDA trial. Both villages' expression of social cohesion involved a leadership style that followed a form of hierarchal order. In Village A, social cohesion was expressed in a top-down, hierarchal form where the Alkalo gave the initial directive to take the MDA medication and those in the village were expected to comply. The community was not actively involved in the implementation and the overall coverage and compliance of the MDA was comparatively low. Conversely, Village B enacted a form of social cohesion where not only the Alkalo, but individuals and community groups, were actively involved at each step. This allowed them to contextualize the MDA to better fit their needs and wants and may have led to much higher coverage and compliance. An African philosophy regarding communitarian discourse provided a guide for interpreting the expressions of social cohesion in the two focus villages. Though this philosophical lens has been used as a framework in other disciplines, this study is one of the first to use it as a way to explore and understand the nuances of MDA participation. This, in turn, sheds light on new implications for future studies to further decolonize global health by demonstrating the importance of non-Western philosophies and logics, including their different manifestations and expressions, in the design and implementation of MDA programs and trials.

## Author credits

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## Acknowledgements

The authors would like to acknowledge, first and foremost, all respondents who took part in this study and all of the villages and people who welcomed the authors into their homes. Second, they would like to acknowledge the staff of the MRC-Gambia who coordinated and conducted the MASSIV trial and greatly supported this study. Lastly, the authors would also like to thank the thoughful and thorough reviewers of this paper. This study was funding by the DFID/NIHR/MRC/Wellcome Tust Global Healh Trials Scheme. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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