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Community-based health for hard-to-reach young domestic workers in Mali

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Dedication

I would like to express my deepest and sincerest gratitude to all those who have supported and guided me throughout the course of this master's program.

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List of Acronyms

Acronym	Full Name / Description
ADDAD	Association pour la Défense des Droits des Aide-ménagères et Domestiques (Mali)
ANRS	Agence Nationale de Recherches sur le Sida et les hépatites virales
ARCAD (Santé PLUS)	Association de Résilience des Communautés pour l'Accès au Développement et à la Santé – Santé PLUS (formerly ARCAD-SIDA Mali)
SanteRCom	Santé, Recherche et COMmunautaire
2DM2K	Dou Dèmè Muso Ka Keneya
DWs	Domestic Workers
ILO	International Labour Organization
MDWs	Migrant Domestic Workers
CRADESC	Centre de Recherche et d'Action pour le Développement Économique et Social Communautaire
UN	United Nations
ENDA	Environnement et Développement du Tiers Monde
LCA	Latent Class Analysis
BIC	Bayesian Information Criterion
USTTB	Université des Sciences, des Techniques et des Technologies de Bamako

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Abstract in English

Word Count: 260

Introduction

Migrant domestic workers are a vulnerable population in terms of health and social protection, and difficult to reach by associations.

Aim of the study

This study evaluates the effectiveness of a community-based initiative implemented by L'Association de Défense des Droits des Aides Ménagères et Domestiques (ADDAD) in Bamako, Mali, in collaboration with ARCAD Santé PLUS in increasing their reach to new profiles of domestic workers.

Methodology

In 2023, in Bamako, Mali, intervention beneficiaries were invited to take part in the survey. Data on their socio-demographic characteristics, working conditions, and vulnerabilities were collected using a cross-sectional questionnaire. The characteristics of workers formerly and newly affiliated with ADDAD were compared in bivariate analyses. Vulnerability profiles were estimated using latent class analysis. A logistic regression model estimated whether newly affiliated people had higher probabilities of being vulnerable according to different themes.

Results

Of the 644 domestic workers, 469 (73%) were newly affiliated and 175 (27%) were previously affiliated to ADDAD. Most newly affiliated workers were less likely to have a formal employment contract (OR = 0.02(0.01-0.05); p<0.001) despite the law. Compared with previously affiliated workers, new affiliates were less likely to have days off (ORadj=0.32(0.19-0.55); p<0.001), to have short-term migration motivations (ORadj=0.57(0.35,0.91); p=0.019), and tended to be victims of domestic violence (ORadj=3.11(1.05-13.4); p=0.071).

Conclusion

The study concludes that the project effectively extended the reach of ADDAD, reaching new profiles of vulnerable domestic workers. It underlines the value of community-based approaches for improving access to essential services and strengthening the social protection of domestic workers in Mali.

Key Words: *community-based approach, domestic workers, vulnerability*

Introduction

Domestic Work

Domestic work is an occupation saturated by the most vulnerable and underserved individuals in society because there are no skills required for participation.[1] These workers usually carry the burden of domestic chores such as cooking, cleaning, and childcare/eldercare and this makes them a very integral part of society. In fact, one sociologist defined domestic workers (DWs) as "The doers of dirty work".[2] This is no surprise because it is the trend that DWs are often from the poorest population with limited access to work due to the lack of education, social standing, and poverty.[3]

Domestic work remains one of the few accessible forms of paid, low-skilled labor for individuals from lower socioeconomic backgrounds, with women comprising approximately 73% of this workforce.[4] Despite being frequently undervalued and informal, domestic labor plays a critical role in sustaining the broader economy by enabling households especially women to outsource care and household responsibilities. The contributions of DWs thus help alleviate the domestic burden that disproportionately falls on women in many societies.[2,5,6]

The term domestic worker does not have a standard definition; however, it is a social/occupational status defined by the International Labor Organisation (ILO) as work performed within the privacy of a home or for a household.[1] Basnyat and Chang (2017) defined a domestic worker as a full-time worker who is tied to an employer either through a regulated work permit or an underground contract that allows him/her to work for a single household.[7] Not all DWs are full-time workers; they can also work part-time depending on the agreement with the employer.[1] According to Domestic Workers' Convention No. 189, the term domestic worker refers to "any person, male or female, engaged in domestic work within the framework of an employment relationship," and domestic work is defined as "work performed in or for one or more households".[8] The status of a domestic worker is not bound by employment status. A domestic worker remains a domestic worker whether they are employed or if they are self-employed.[9]

Global Context of Domestic Work

In 2019, there were at least 75.6 million people employed as DWs across the world[10], while in 2013 there were about 67 million, out of which about 17% were migrant domestic workers (MDW), suggesting a massive growth in this field in the past years.[1] The use of DWs in households varies across different continents, countries, and cultural contexts. For example, Africa as a continent is the third biggest employer of domestic work after Asia, the Pacific, and the Americas. In 2021, Africa had approximately 9.6 million DWs[11], a number likely to rise due

to global trends over the past decades and rapid urbanization. The growing demand is driven by demographic shifts such as aging populations, increased female labor force participation, and the struggle to balance work and family life in urban settings. On the flip side, poverty and limited employment opportunities continue to push many individuals, particularly women, into the domestic labor market as a last resort.[12]

Migration and Domestic Work

Rapid urbanization globally has resulted in an increase in migration patterns around the world. Migration for domestic work is a well-documented occurrence.[13,14,11,15,16] In 2019, the ILO reported that there were at least 169 million migrant workers and about 70 million of those workers were women.[11] This constitutes about 4.9% of the global workforce. In fact, in some parts of the world, MDWs make up a significant proportion of all the migrant workers or the working population in that region.[11] For example, the Arab states, where DWs make up 12.3% of total employment; in Africa, DWs make up about 16% of the working population and in Sub-Saharan Africa; DWs make up about 18 % of the total working population.[11]

Challenges and Vulnerabilities Associated with Domestic Work

Domestic work, as essential as it is, is very overlooked and undervalued in many regional contexts.[17,18] This has caused this group of people to be overlooked in terms of policies and regulations. The informal nature of domestic work has seen it remain severely underpaid and underappreciated as an occupation.[18,11] However, little is known about the diversity of this population, especially in low-income settings. Indeed, some economic contexts such as those in Sub-Saharan African countries have, in general, labour markets with very high rates of informal work. For some groups including women, young and low educated people chose to work voluntarily in this sector as it is the one that maximizes their opportunities (i.e. comparative advantages). Thus, it is crucial to understand the heterogeneity of undeserved and vulnerable populations in order to align their choices with their needs.

Mental and Physical Health Risks

MDWs are a special group of people who, in addition to the vulnerabilities of the job, are without social support and are at risk of mental, social, and occupational risks. In Macao, migrant Filipino workers were seen to experience mental health challenges such as depression and anxiety and were at increased risk of perpetuating high-risk behaviours such as gambling and substance abuse and addiction. These issues were further exacerbated by their poor living and working conditions.[19] DWs are not only at risk of mental health challenges due to the nature of their work but also face significant physical risks. Tasks such as lifting, carrying, and pushing increase their likelihood of developing musculoskeletal issues, particularly in the back.[20,21]

Additionally, working in kitchens exposes them to a higher risk of burns, cuts, slips, falls, and strains.[22]

The International Labour Organization (ILO) has identified several specific risks to which DWs are particularly vulnerable. These include long and exhausting working hours, exposure to toxic chemical products, carrying heavy loads, handling dangerous utensils such as knives, cleavers, and hot pots, as well as inadequate or insufficient housing and food. Furthermore, many face humiliating or degrading treatment, including verbal and physical abuse, and in some cases, sexual exploitation. These risks are amplified when MDW girls live in their employer's household.[11,23]

Socioeconomic Factors that Define Domestic Work

The risks surrounding the job are very much affected by the socioeconomic factors that drive an individual into doing this kind of work.[6] These include poverty, gender dynamics, ethnicity and poor autonomy.[6] It is no surprise that these drivers directly influence the risks experienced by DWs when carrying out their jobs. MDW tend to be ethnic minorities increasing their health vulnerabilities; Jacobson, Hund, and Soto Mas in 2016 found that language was a very strong predictor for health literacy and by proxy health outcomes.[24] For example, if MDW migrate to a place with an unfamiliar spoken language; there is a chance that their health outcomes are greatly affected by this disparity especially due to the inability to comprehend or communicate medical situations or events.[25,26]

Healthy Immigrant Effect

The healthy immigrant effect has been documented in MDWs as well. This phenomenon occurs when the health of a migrant significantly declines after arriving in host communities or countries with seemingly better healthcare.[27] Their health is particularly fragile due to experiences unique to being a migrant worker, such as lack of family support, language and cultural differences, inadequate social security, and financial.[28,19] This experience can persist over extended periods, often spanning several years. In Israel, this effect was observed to last for years, leaving migrants with compromised health status, eventually becoming comparable to the natives after about twenty years.[29] This highlights the challenges faced by MDWs, who often encounter barriers to accessing healthcare and social services in their host countries and other systematic issues like non-payment of salaries, denial of sick days, lack of written contracts even when required by law, and no off days.[30]

Hard to Reach Populations

Hard-to-reach individuals are colloquially referred to as hidden or socially disadvantaged groups[31,32] , marginalized[33], underrepresented[34], and vulnerable[35], which is a perfect

description of MDWs. These are women and girls, sometimes so young they haven't reached puberty, who have had to upstage their lives and move to another unfamiliar place in search of better opportunities and lives. For example, in Bamako, according to the MICS survey between 2014 and 2017, over 80% of female DWs in Mali were 18 or under, and about 30% were below the age of 14.[36]

Viewing Domestic Work in Mali through a Socioecological Lens

The challenges faced by MDWs are multidimensional, rooted not only in economic necessity but also in cultural and geopolitical dynamics. The institution of domestic work is deeply embedded within specific cultural contexts that shape both the perception of the work and the demographics of those who perform it due to historical migration patterns, bilateral labour agreements, or prevailing stereotypes about skills and servitude.

For instance, Filipino migrant workers constitute a significant portion of the domestic workforce in Macao, where cultural perceptions and spoken language influence employer preferences.[19] Similarly, in Singapore, the domestic work sector is largely filled by migrant women from India, Indonesia, Myanmar, Sri Lanka, and the Philippines, reflecting regional labour mobility trends and the structured recruitment of women from these countries for domestic roles.[37]

Internal migration also plays a significant role in shaping domestic labour markets. In Mali, for example, rural-to-urban migration accounted for 13.7% of total migration in 2019.[38] Such internal movements are often driven by poverty, climate change, or conflict, with young women frequently entering domestic work in urban areas as one of the few accessible forms of employment.

Interpersonal and Intrapersonal Context

In Mali, there is a tribal context to migration. The Fulanis and Tuaregs are known for migration for nomadic purposes/seasonal migration, which has been linked to climate change.[15] These individuals who migrate often become DWs. A study done by CRADESC in 2024 revealed that the Bambaras and Mossi were the most represented tribes in domestic work in Mali and Burkina Faso respectively.[16] Hard-to-reach populations often face severe health vulnerabilities because they work long, arduous hours; are migrants disconnected from government benefits; do not keep jobs for long periods of time; and keep moving around.[39] Additionally, socially these individuals can experience a sense of social isolation being in a place with different norms and culture, experience language barriers, or they may find themselves amongst people who do not trust them or want them around.[39] In addition, Ho et al. (2022) identified social isolation as a significant stressor in the lives of DWs.[40]

Environmental

There is an environmental aspect to the existence and trends in domestic work. In Mali, for example, migration for domestic work has been linked to climate change.[15] Desertification of the northern parts of the region and drought are leading to more people needing to move towards the south for survival; once field activities are concluded, these individuals move away towards more favorable landscapes for greener pastures, quite literally within and without Mali. [3,41]

Politics and Policy

Additionally, aside from the policy issues that surround migrant domestic work, there are also political aspects. Poverty, early marriage, armed conflict, and youth unemployment are factors leading to migrant domestic work.[6,15,23,42] In Mali, since 2012, there have been multiple instances of armed conflict in the Malian region, causing significant internal displacement.[15] The crises that originated in the north have only contributed to the mass movement of Northern Malians towards the south of the country.[15,41,43]. Legally, DWs, especially MDW in Mali, have rights. The question is not whether they have rights, because in theory, yes, they do, but to what extent are these rights being enforced? Culturally and legally, domestic work is widely accepted. Its prevalence is further reinforced by political and religious influences.[44] Economically, these women and girls are pushed into this field as poverty is a driver of domestic work.[6,16,23] Even in the ways in which the law tries to meet these young girls, there are still systems that limit the true reach of the law. One critical example of this is the grandniece system observed in Bamako, Abidjan, and Dakar, where young girls are "adopted" by families for their servitude. This is a significant contributor to the underreporting of the true number of DWs in the region, and these girls particularly contribute to the hard-to-reach populations.[45] Additionally, the question of language barriers in which these women do not understand or cannot express the extent to which they have rights leaves them vulnerable to abuse and terrible living and working conditions.[28]

Challenges in Reaching Domestic Workers

Despite the existence of numerous research studies and policies aimed at addressing the needs of DWs, this group remains hard-to-reach.[46,44,47,48] The primary reason is that these women and girls often work in the privacy of other people's homes, under unrealistic hours; with limited freedom and are sometimes perceived as members of the family.[45] Policies such as the ILO Convention 182 on the worst forms of child labor are designed to protect these individuals[46] especially the underaged. Mali also has the Malian Labor Code, which governs all employer-employee relationships, including that of DWs.[47,48] However, reaching people in

such precarious situations is challenging. One study identified several barriers that hinder engagement efforts with hard-to-reach populations, including

- Financial instability
- Mobility in residence and work
- Discrimination and isolation
- Limitations in local resources

These barriers significantly affect the ability to effectively implement policies and provide support to DWs.[39]

The Role of Community-Based Approaches and Organizations

There exists an obvious gap in the government's ability, technically and resource-wise, to truly reach this population, and this is why the importance of community-based organizations and engagement cannot be overstated. The problem is domestic work creates its own laws based on the household within which it takes place. Literature establishes that community-based interventions are effective in reducing existing disparities in populations and increasing their access to health services. According to Nguyen, Cheah, and Chambers (2019), there is a four-pronged approach to effective community-based engagement:

- Formative research to improve understanding of the population.
- Integrating into local life.
- Networking with relevant stakeholders; and
- Developing local resources. [39]

Law No. 92-020, relating to the Code of Work in Mali, in its article 1 stipulates that DWs in Mali are provided labor law: contract of work, social security, retirement pension, paid leave, etc.[47] There is already an under-implementation of this law, but additionally the girls in Mali are not even aware of the laws that exist to protect them.[44] Community-based organizations have played an integral role in awareness campaigns regarding the policy in Mali, such as Environnement et Développement du Tiers-Monde – Mali (ENDA) etc.; In the same vein lies the existence of ADDAD.[44] We cannot deny how important they are in this regard.

Association de Défense des Droits des Aide-ménagères et Domestiques (ADDAD)

ADDAD was founded in 2011 to give a voice to the DWs in Mali and improve their living and working conditions. ADDAD is the main peer-based community-based organization (CBO) for DWs in Mali, providing social support, legal assistance, and training. Currently, ADDAD operates in the six municipalities of the Bamako District and Ségou and Koulikoro.[49]

The organization plays a crucial role in highlighting the social and legal problems faced by DWs in terms of geographical mobility and working hours and related discrimination and stigma. ADDAD conducts awareness campaigns and radio broadcasts in Bamako and regional areas to inform DWs about their rights and available support services.

ADDAD, however, lacked the capacity to deliver medical services and partnered with Association pour la Résilience des Communautés pour l'Accès au Développement et à la Santé (ARCAD Santé PLUS), a specialized organization in sexual and general health for key populations affected by HIV but with limited contact with and knowledge of the domestic worker population. This merge gave birth to the 2DM2K project.

The Community-Based 2DM2K Project

The ANRS-0005s 2DM2K project (2021-2023) is a collaboration between some Malian CBO's like ARCAD Santé PLUS and ADDAD, and the research team SanteRCom(Santé, Recherche et Communautaire), which specializes in community-based research on key HIV populations. ARCAD Santé PLUS previously known as ARCAD-SIDA Mali is involved in the fight against HIV/AIDS in most known key HIV populations, but also against tuberculosis and malaria, and has extended its mission to the promotion of sexual health. SanteRCom was particularly involved in synergizing the problems faced by the CBOs and producing an evidence-base on the activities conducted by this collaboration to foster continuation of knowledge, inform future collaborations and strengthen future community-based activities.

The need to better understand the health needs of DWs and to explore the feasibility of implementing a tailored community-based healthcare offer adapted to their age, vulnerabilities, living pace, and constraints led to the development of the community-based research and intervention project ANRS-0005s 2DM2K ('Dou Dèmè Muso Ka Keneya' or 'The health of DWs' in the Bambara language), which was conducted in 2023 in Bamako. The ANRS-0005s 2DM2K project involved the implementation of a community-based health service, offering pregnancy tests and screening for HIV, STIs, hepatitis B and C, and tuberculosis, integrated into the existing community activities typically conducted by ADDAD. Awareness campaigns were conducted by ADDAD, along with radio broadcasts in Bamako and regional areas to inform DWs about the initiative. Medical and socio-behavioural data were collected from DWs who had a medical consultation and who agreed to participate in the research.

Main Objective of the study

This study aims at evaluating how effective the contributions of the 2DM2K community-based project were in enhancing ADDAD's ability to reach new profiles of DWs in Mali.

Specific Objectives of the Study
1. Describe the community linkage:
   - Assess awareness of ADDAD prior to the survey, including timing and source of information (e.g., campaign in villages of origin, Bamako-based outreach, media exposure).

- Evaluate familiarity with ADDAD's services and locations (e.g., headquarters, branches, focal points).
- Document any previous support received from ADDAD and the nature of that support.

2. Evaluate the proportion of newly reached DWs (i.e., those who had no prior contact with ADDAD)
3. Compare newly reached DWs vs. previous ADDAD users in terms of:

- Analyse differences in sociodemographic profiles and employer characteristics.
- Assess disparities in health vulnerabilities and access to health and support services.

Factors that could explain the difference in reach by ADDAD through the 2DM2K project

Several factors could explain this difference in reach resulting in reaching a new profile of domestic worker:

I. Lack of prior awareness of ADDAD before the campaign. The 2DM2K project allowed for campaigns to be carried out in the villages of origin, Bamako, the head offices and annexes which could account for more vulnerable domestic workers knowing about ADDAD.
II. Structural or personal barriers (e.g., isolation in private households, long working hours, employer restrictions) that previously limited engagement.
III. Increased motivation to participate due to the campaign's pairing with free medical checkups or other incentives.
IV. Greater vulnerability or need among certain subgroups made the campaign particularly appealing.

Hypotheses

This study hypothesizes that
1. There is a significant difference in the profiles of the newly reached DWs when compared to the previously reached DWs by ADDAD before the 2DM2K project.
2. The campaign may have enabled ADDAD to connect with DWs who were previously unaware of or unable to access its services.
3. These newly reached DWs may differ significantly from existing beneficiaries in terms of their socioeconomic background, work conditions, and health vulnerabilities.

Research Questions

1. Did the campaign reach a more diverse or more vulnerable segment of DWs compared to those previously in contact with ADDAD?

2. How do these newly reached subgroups compare with existing ADDAD users in terms of:
   - Sociodemographic characteristics
   - Work conditions and employer profiles
   - Health needs and vulnerabilities
   - Access to and use of health and support services

Methodology

Research Design

This study employed a cross-sectional design to comprehensively evaluate the contribution of the ANRS-0005's 2DM2K project in enhancing ADDAD's ability to reach new profiles of migrant DWs in Mali.

The 2DM2K Dataset
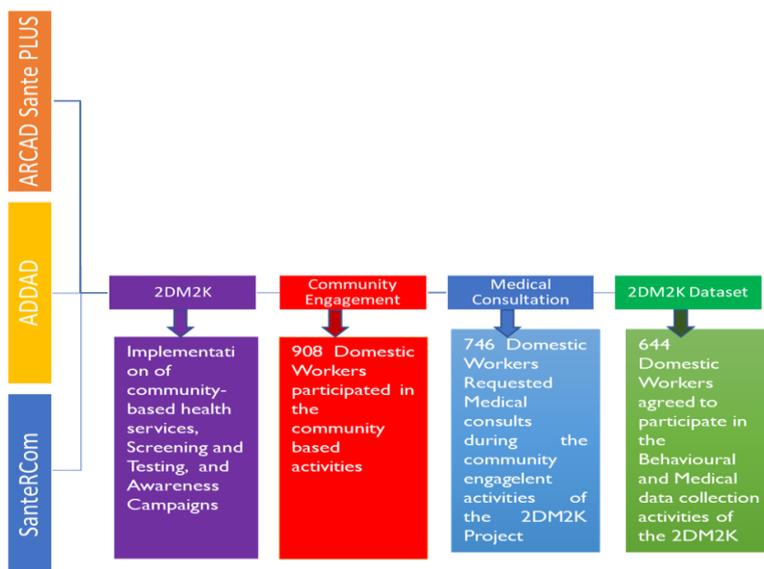
A total of 908 DWs participated in the 2DM2K project. Of these, 746 requested medical consultations, and 644 provided medical and socio-behavioral data. This dataset, collected through the collaboration of ARCAD Santé PLUS, ADDAD, and SanteRCom, aims to understand the health needs of DWs and explore the feasibility of tailored community-based healthcare.

Figure 1Infograph of the 2DM2K activities and quantitative data collected

Inclusion Criteria

In order to participate in the survey, the participants had to meet the following criteria:
- Be a woman working as a domestic worker in Bamako,
- Speak one of the most used languages (Bambara, Dogon, or French),
- Be at least 12 years old,
- Provide written informed consent to participate.

Data Collection

Data were collected using structured questionnaires administered to 644 DWs who were either already affiliated with ADDAD or became affiliated through the 2DM2K project. The survey included both closed-ended and open-ended questions to gather comprehensive social, behavioural, and medical data.

Missing Data

The outcome variable in this dataset specifically, whether participants had been exposed to ADDAD prior to the 2DM2K project, had no missing values. Consequently, there was no need for imputation or exclusion due to missing data. This approach aligns with best practices in study design, which emphasize the importance of collecting complete data for key variables to minimize bias and the need for post hoc imputation.[51]

Evaluating the proportion of newly reached workers and Describing awareness of ADDAD Prior to the Survey

To describe the community linkage with ADDAD, the respondents were asked if they had ever interfaced with ADDAD before the 2DM2K community project. This variable became the main outcome of the analysis of the data.

The participants who had interfaced with ADDAD were classed as previously reached and the newly reached were excluded from this objective.

Familiarity with ADDAD and Locations Visited

The previously reached were asked a series of questions that helped describe the community linkage ADDAD has. These questions included where they learned about ADDAD, when they learned about ADDAD, where they learned about ADDAD if it was from family, adverts, or the ADDAD community program, and if they had received any support from ADDAD.

Additionally, they were asked which facilities of ADDAD they had visited whether

- The headquarters
- Regional branches
- Local focal points or community-based offices

This measure aimed to capture both passive and active forms of engagement with ADDAD.

Previous Support Received from ADDAD

Participants who indicated that they had received some sort of support from ADDAD were asked to indicate which type of support in particular they had benefitted from. The forms of support provided by ADDAD were listed out in the questionnaire and are as follows:

- Finding Work

- Negotiating Salary
- Negotiating Work Hours/Schedule
- Negotiating Off Days
- Negotiating Tasks to Complete
- Negotiating Living Conditions
- Drafting a Work Contract
- Protection against Physical and Psychological Violence

Comparative Analysis of Newly Reached vs. Previous ADDAD Users

To explore differences between newly reached DWs and those who had prior contact with ADDAD, a comparative analysis was conducted across several key dimensions: sociodemographic characteristics, professional trajectories, employer characteristics, and health vulnerabilities. This analytical approach allows for the identification of patterns and disparities that may reflect the impact of prior engagement with ADDAD's support mechanisms, as well as broader structural differences within the domestic workforce.

This aspect of the analysis was done to answer the primary research goal: was ADDAD able to reach new profiles of DWs through the 2DM2K project and what are these differences that exist between the previously reached and newly reached DWs?

The Outcome Variable

The participants were asked "Prior to today, have you ever heard of ADDAD?" Those who answered "yes" were classified as "previously exposed" and those who answered "no" were classified as "Newly reached". And this served as the binary outcome variable for this analysis.

Sociodemographic Characteristics

Data were collected on age, gender, education level, marital status, place of origin and if they still had both parents. Research has shown that having both parents influences the health outcomes of DWs.[6] These variables provided a comparable demographic profile of both groups of DWs.

Employer Characteristics

Information was gathered on current or most recent employer profiles. This data was mostly centered on the treatment the DWs had faced at the hands of their employers. For example, if the DWs had experienced physical harm from their employers, the type of accommodation/room/condition they sleep in; if they were allowed hygiene breaks; and if they were allowed off days as is stipulated in the Malian labour code. [47]

Health Vulnerabilities

To contextualize health vulnerability, health issues were classified into four main categories: physical, mental, sexual, and reproductive. These dimensions were examined in relation to participants' lived experiences, particularly within the context of domestic work.

Health-related questions addressed a range of issues, including; Experiences of illness and self-perception of overall health; Access to health services, with particular attention to barriers and experiences specific to DWs; Perceived stress, emotional distress, and quality of sleep; Exposure to abuse or neglect, including incidents of sexual assault; Access to contraception and reproductive health services; Knowledge and awareness of sexually transmitted infections (STIs), including HIV.

Data Analysis

Descriptive statistics were used to summarize each variable across both groups. Comparative analysis between newly reached DWs (469(73%)) and previously affiliated to ADDAD DWs (175(27%)) was performed using cross-tabulations and appropriate statistical tests, i.e chi-square tests and Fisher's test for categorical variables, depending on whether the assumptions for the chi-square test were met. For the continuous variables, independent t-tests or the Mann-Whitney U test were applied depending on the data structure. Subsequently, the variables with a significant difference between the groups were then included in the univariate analysis.

Univariate Analysis

Univariate analysis was done using the exposure to ADDAD as the outcome in a logistic regression to compare across the previously reached and newly reached DWs to see which group was likely to experience these indicators of vulnerability. Variables that demonstrated statistically significant associations (P-value < 0.2 and CI that did not include the null "1") to avoid excluding potentially important predictors prematurely.[52] The variables that met these criteria were then included in a multivariate logistic regression model to further explore and quantify the relationship between these indicators and interface with ADDAD. There was no need to adjust for confounders in this study because variables such as age, gender, ethnicity, and education status were used as predictors/explanatory variables in the multivariate analysis.

Latent Class Analysis

A latent class analysis was then performed to identify unobserved/latent subgroups within the population. This method was chosen to uncover distinct profiles or classes that regular bivariate analysis and logistic regression would otherwise be unable to identify.

Class Construction

To better understand the different types of vulnerability among DWs, we grouped related variables into key areas that reflect the study's goals:

- Socioeconomic status
- Work-related (occupational) vulnerabilities
- Physical health
- Migration-related indicators of vulnerability
- Mental health
- Access to healthcare
- Sexual and Reproductive Health Vulnerabilities

The variables would be used to create latent classes under the above themes that will be used as explanatory variables in the final analysis.
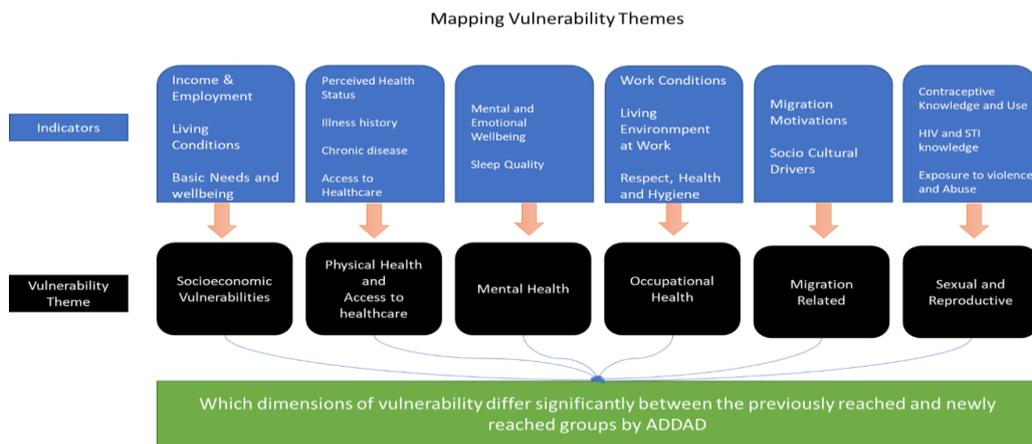
Figure 2 Vulnerability Map used to construct explanatory variables for LCA

These categories were chosen based on what we already know about the challenges DWs often face. Some data points were missing because certain questions were only asked of specific groups (for example, based on previous answers). Instead of removing these cases, they were kept in the analysis and marked as "Unknown" or "Not Applicable" or "Not Concerned" so no valuable information or variability would be lost.

The LCA was then run. The optimal number of classes was determined using a combination of statistical and practical criteria:

- Bayesian Information Criterion (BIC): The lowest value often meant a better fit.

The BIC is favoured over the AIC because the Akaike Information Criterion (AIC) can lead to overestimation of the number of latent classes. The BIC poses a stronger penalty for complexity of the model[53]

- Interpretability: After selecting the model based on the lowest BIC, the classes were then interpreted to see if they yielded theoretically meaningful classes.

In cases where the model with the best BIC included a class with less than 5% of the sample. In those cases, a more parsimonious model with fewer classes was selected. This approach prioritized real-life interpretability and reduced the risk of model overfitting, ensuring that the final class was both statistically sound and meaningful.[54]

Multivariate Latent Class Regression

To further explore the differences that exist between these two groups of DWs, a multivariate logistic regression was conducted with the latent classes derived from the LCA as the dependent variables, while exposure to ADDAD was treated as the independent variable to explore if the exposure to ADDAAD could be an indicator for which class individuals belonged to. This approach allowed for the estimation of the odds of class membership in each class using one class as the reference category while accounting for differences in exposure to ADDAD.

Software

The data analysis was conducted using R version 4.4.2 (2024-10-31 ucrt), a versatile statistical software tool ideal for the complex analyses that were required in this project.

Ethical Considerations

Informed Consent:
The DWs who participated in the data collection were informed clearly about the study's purpose, risks, and benefits both verbally and in writing. For DWs with limited literacy or language barriers, accurate interpretations were made available.
For minors (aged 12–17), the presence and signed consent of a trusted representative from ADDAD was mandatory.
The lower age limit was determined in consultation with the Ethics Committee of the University of Science, Techniques and Technology of Bamako (USTTB) in Mali. For minor participants, the participation conditions were confirmed by Professor Mahmadou Diakité, Permanent Secretary of the Ethics Committee.

Confidentiality:
The confidentiality of the participants was respected and maintained throughout the study. All personal identifiers were removed from the data set and unique identifiers were used instead. Data were entered in Bamako using the KoBoToolbox platform and securely processed at CIRSAC (ARCAD Santé PLUS) and the ANRS Department for Clinical Research Oversight. Data were transmitted securely, merged using anonymous identifiers, and the final database was shared with researchers from the SanteRCom team (UMR1252 SESSTIM) via secure

connection. The Inserm-ANRS declared the data processing to the CNIL, in compliance with French data protection laws (Law No. 78-17 of January 6, 1978, as amended, including Law No. 2018-493 of June 20, 2018).

Ethical Approval:

The ANRS-0005s 2MD2 K project received approval from the Ethical Committee of Mali on the 19th of July 2021 (N°2021/180/CE/USTTB), which was renewed on the 5th April 2022 (n°2022/79/CE/USTTB).

Validity and Reliability

Validity:

The questionnaires used in the quantitative survey were developed based on the results of the exploratory qualitative study, which helped identify key social and health issues affecting DWs. The formulation of the questions was carried out in a participatory manner, in close collaboration with ADDAD and ARCAD, to ensure clarity and cultural relevance. The collection and laboratory analysis of medical samples were conducted in accordance with national standards and good clinical practices.

Construct validity was enhanced through a clear operationalization of variables and alignment between research questions, data collection instruments, and analytical methods. Pilot testing was conducted with a small sample from the target population to refine questionnaire items to ensure that the tool was accurate and easy to understand and tested what it was supposed to test.

Internal validity was maintained by ensuring consistency in data collection procedures. This was done by training the data collectors to ensure that they collected accurate and complete data. Data collection was carried out by female Malian interviewers in a community-based setting (i.e., among peer DWs), which helped build trust with participants.

Reliability:

Reliability was ensured through the consistency and stability of the data collection tools and procedures. Internal consistency was assessed using Cronbach's alpha, with a threshold of 0.70.

Proportion of newly reached domestic workers (no prior contact with ADDAD)

This study had a total of 644 DWs who responded to the survey. Out of that 644, about 73% (469 DWs) of the respondents were newly reached by ADDAD through the 2DM2K project, while about 27% (175 DWs) were previously affiliated with ADDAD.

Demographic Characteristics of the DWs

Characteristic/ Variable	Overall (N=644)	Newly Reached (N=469)	Previously Reached(N=175)	p-value
Prior Exposure to ADDAD				
Newly Reached	469(72.8%)	469 (100.0%)	0 (0.0%)	_
Previously Reached	175(27.2%)	0 (0.0%)	175 (100.0%)	_
Age (Mean, SD)	18.8 (6.1)	18.8 (6.2)	18.9 (5.7)	0.3
Educated	187 (100%)	132 (100%)	55 (100%)	>0.9
Ethnicity				**0.012**
Bambara	354 (55%)	249 (53%)	105 (60%)	
Fulani (Peuhl)	58 (9.0%)	45 (9.6%)	13 (7.4%)	
Dogon	70 (11%)	55 (12%)	15 (8.6%)	
Bozo	37 (5.7%)	20 (4.3%)	17 (9.7%)	
Other	125 (19%)	100 (21%)	25 (14%)	
Highest Level of Education				0.8
Primary - First Cycle	187 (63%)	132 (62%)	55 (65%)	
Primary - Second Cycle	31 (10%)	23 (11%)	8 (9.5%)	
Quranic Education	9 (3.0%)	8 (3.8%)	1 (1.2%)	
Third Cycle or Higher	1 (0.3%)	1 (0.5%)	0 (0%)	
No Organized Education	69 (23%)	49 (23%)	20 (24%)	
Both Parents Alive				0.7
Both Alive	526 (82%)	384 (82%)	142 (81%)	
One Deceased	94 (15%)	66 (14%)	28 (16%)	
Both Deceased or Unknown	24 (3.7%)	19 (4.1%)	5 (2.9%)	
Marital Status				**0.016**
Single	483 (75%)	340 (72%)	143 (82%)	
Married	161 (25%)	129 (28%)	32 (18%)	

[1] Mean (SD); n (%)
[2] Wilcoxon rank sum test; Fisher's exact test; Pearson's Chi-squared test

Table 1 Demographic characteristics of the population

The mean age of participants was 18.8 years (SD = 6.1), with no statistically significant difference observed between groups (p = 0.3).

All participants were educated to some degree, with 9 (3.0%) having Qur'anic education. Educational attainment did not differ significantly between groups (p = 0.8). Most participants had completed the first cycle of primary education (63%), while 23% reported having no organized education. A small proportion had completed higher levels of primary or Quranic education.

There was a statistically significant difference in ethnic distribution between the groups (p = 0.012). The Bambara ethnic group made up the majority overall (55%), with a higher representation among previously exposed individuals (60%) compared to the newly reached (53%). Other ethnic groups included Fulanis (Peulh), Dogon, Bozo, and others, with varying proportions across groups.

Parental status was similar across groups (p value = 0.7), with 82% of participants reporting that both parents were alive.

Marital status differed significantly between groups (p = 0.016). Most of the previously exposed individuals were single (82%) compared to those newly reached (72%), while the proportion of married individuals was lower in the previously exposed group (18%) compared to the newly reached (28%).

Community Linkage of ADDAD with the Previously Reached Domestic Workers

Variable	Overall (N=175)
Where did you learn about ADDAD	
Awareness Program in the Village	131 (75%)
Other/ Word of Mouth	38 (22%)
Radio Program in Bamako	4 (2.3%)
Radio Program in Village	2 (1.1%)
Place of primary interface with ADDAD	
ADDAD Annex	27 (19%)
ADDAD Headquarters	87 (61%)
Focal Point of ADDAD	28 (20%)
Precise town where ADDAD is Visited	
Bougouba	13 (46%)
Faladié	5 (18%)
Hamdallaye	2 (7.1%)
Lafiabougou	3 (11%)
Niamakoro	1 (3.6%)
Senou	1 (3.6%)
Taliko	3 (11%)
Time Since Learning About ADDAD	
Less than a year	70 (49%)
More than a year	72 (51%)
What kind of support have you received from ADDAD	
Finding Work	74 (52%)
Negotiating Salary	72 (51%)
Negotiating Work Hours/Schedule	67 (47%)
Negotiating Off Days	52 (37%)
Negotiating Tasks to Complete	51 (44%)
Negotiating Living Conditions	64 (45%)
Drafting a Work Contract	69 (49%)
Protection against Physical and Psychological Violence	58 (41%)
Other Things	52 (37%)
I don't Know what they helped me with	19 (13%)
Satisfaction with Prevention and Care Services from ADDAD	
Neutral/Not at all satisfied	4 (2.3%)
Satisfied	38 (22%)
Very Satisfied	133 (76%)

[1] n (%)

Table 2 Describing community linkage of ADDAD with Previously reached DWs

Sources and Timing of Information

The previously reached DWs were filtered out and answered the questions pertaining to the community linkage. Out of the 175 previously reached DWs, the majority (75%) reported first learning about ADDAD through awareness programs conducted in their village. Word of mouth was the second most common source (22%), while only a small proportion cited radio programs, either in Bamako (2.3%) or in their village (1.1%).

Regarding the timing of exposure, 49% of participants had learned about ADDAD within the past year, while 51% had known about the organization for more than a year.

Familiarity with ADDAD Locations Visited

Participants reported engaging with ADDAD through various locations. The majority (61%) had interacted with the organization at its headquarters in Bamako, while 20% had done so through a focal point and 19% through an annex. When asked about the specific towns where they visited ADDAD, Bougouba was the most frequently mentioned (46%), followed by Faladié (18%), Taliko and Lafiabougou (11% each), and smaller proportions for Hamdallaye (7.1%), Niamakoro(3.6%), and Senou (3.6%).

Previous Support Received from ADDAD

The previously reached DWs reported receiving support from ADDAD in a variety of areas. The most cited forms of assistance included help with finding work (52%), negotiating salary at the workplace (51%), and drafting a work contract (49%). Other areas of support included negotiating work hours or schedules (47%), improving living conditions (45%), and defining tasks for work (44%). Additionally, 41% of participants reported receiving protection against physical and psychological violence. A small proportion (13%) indicated that they were unsure of the specific support they had received.

Satisfaction with Prevention and Care Services from ADDAD

Overall satisfaction with ADDAD's prevention and care services was high. The majority (76%) of the participants reported being very satisfied, while 22% were just satisfied. Only 2.3% expressed neutrality or dissatisfaction with the services received.

Comparative Analysis of Newly Reached and Previously Reached Domestic Workers

Variable	N	Overall (N=644)	Previous Exposure (N=175)	Newly Reached (N=469)	p-value (Bivariate)	OR (unad-justed)	95% CI	p-value (Univariate)
Demographics								
Marital Status					0.016			
Single	483 (75%)	340 (72%)	143 (82%)	483 (75%)		Ref	Ref	**Ref**
Married	**161 (25%)**	**129 (28%)**	**32 (18%)**	**161 (25%)**		**1.70**	**1.11, 2.65**	**0.017**
Ethnicity	644				0.012			
Bambara		354 (55%)	249 (53%)	105 (60%)		—	—	—

Variable	N	Overall (N=644)	Previous Exposure (N=175)	Newly Reached (N=469)	p-value (Bivariate)	OR (unad-justed)	95% CI	p-value (Univariate)
Fulani (Peuhl)		58 (9.0%)	45 (9.6%)	13 (7.4%)		1.46	0.78 – 2.92	0.3
Dogon		70 (11%)	55 (12%)	15 (8.6%)		1.55	0.86 – 2.95	0.2
Bozo		**37 (5.7%)**	**20 (4.3%)**	**17 (9.7%)**		**0.50**	**0.25 – 0.99**	**0.045**
Other		**125 (19%)**	**100 (21%)**	**25 (14%)**		**1.69**	**1.04 – 2.81**	**0.038**
Employer Characteristics								
Do You Have a Contract	**556**	**75 (13%)**	**69 (43%)**	**6 (1.5%)**	**<0.001**	**0.02**	**0.01, 0.05**	**<0.001**
Are you allowed off days	**643**	**131 (20%)**	**50 (29%)**	**81 (17%)**	**0.002**	**0.52**	**0.35, 0.79**	**0.002**
Self-employed/Contract	644				0.011			
with employer without a contract		481 (75%)	92 (53%)	389 (83%)		ref	ref	ref
with an employer with a contract		**75 (12%)**	**69 (39%)**	**6 (1.3%)**		**0.02**	**0.01, 0.05**	**<0.001**
self-employed		88 (14%)	14 (8.0%)	74 (16%)		1.25	0.69, 2.40	0.5
Violence by employer	644	50 (7.8%)	18 (10%)	32 (6.8%)	0.14	0.64	0.35, 1.19	0.15
Employer's refusal to pay a salary	**556**	**48 (8.6%)**	**23 (14%)**	**25 (6.3%)**	**0.002**	**0.41**	**0.22, 0.74**	**0.003**
Number of hours of work per week	642				0.001			
Less than 105		480 (75%)	114 (66%)	366 (78%)		ref	ref	ref
105 or more		**162 (25%)**	**60 (34%)**	**102 (22%)**		**0.53**	**0.36, 0.78**	**0.001**
Health Vulnerabilities and Perceptions								
Perception of Personal State of Health	644				0.054			
Bad		46 (7.1%)	18 (10%)	28 (6.0%)		ref	ref	ref
OK		362 (56%)	103 (59%)	259 (55%)		1.62	0.84, 3.03	0.14
Excellent		**236 (37%)**	**54 (31%)**	**182 (39%)**		**2.17**	**1.10, 4.19**	**0.023**
Have Chronic Disease or More	**644**	**66 (10%)**	**25 (14%)**	**41 (8.7%)**	**0.039**	**0.57**	**0.34, 0.99**	**0.041**
Occupational Vulnerabilities								
Self Employed	644				0.011			
No		556 (86%)	161 (92%)	395 (84%)		ref	ref	ref
Yes		**88 (14%)**	**14 (8.0%)**	**74 (16%)**		**2.15**	**1.22, 4.08**	**0.012**
Who is in charge of your income	644							
Family		**258 (40%)**	**56 (32%)**	**202 (43%)**	**0.011**	**1.61**	**1.12, 2.33**	**0.011**
Landlady		83 (13%)	17 (9.7%)	66 (14%)	0.14	1.52	0.88, 2.75	0.14
Boss		**105 (16%)**	**15 (8.6%)**	**90 (19%)**	**0.001**	**2.53**	**1.46, 4.68**	**0.002**
Authority		5 (0.8%)	3 (1.7%)	2 (0.4%)	0.13	0.25	0.03, 1.49	0.13
ADDAD		67 (10%)	67 (38%)	0 (0%)	<0.001	0	0.00, 0.37	>0.9
Self		**126 (20%)**	**17 (9.7%)**	**109 (23%)**	**<0.001**	**2.81**	**1.67, 5.00**	**<0.001**
Activities as a Housekeeper	644							0.7
Cleaning		**526 (82%)**	**153 (87%)**	**373 (80%)**	**0.021**	**0.56**	**0.33, 0.91**	**0.002**
Grocery shopping		403 (63%)	111 (63%)	292 (62%)	0.8	0.95	0.66, 1.36	**0.022**

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Variable	N	Overall (N=644)	Previous Exposure (N=175)	Newly Reached (N=469)	p-value (Bivariate)	OR (unadjusted)	95% CI	p-value (Univariate)
Meal preparation		306 (48%)	85 (49%)	221 (47%)	0.7	0.94	0.67, 1.34	**0.8**
Laundry		551 (86%)	154 (88%)	397 (85%)	0.3	0.75	0.44, 1.24	**0.7**
Childcare		166 (26%)	41 (23%)	125 (27%)	0.4	1.19	0.80, 1.80	**0.4**
Selling		**44 (6.8%)**	**5 (2.9%)**	**39 (8.3%)**	**0.015**	**3.08**	**1.31, 9.06**	**0.02**
Bedding material at work	**644**				**<0.001**	**0.41**	**0.22, 0.74**	**0.003**
Mat		338 (52%)	71 (41%)	267 (57%)		ref	ref	**ref**
Mattress/Armchair		**272 (42%)**	**90 (51%)**	**182 (39%)**		**0.54**	**0.37, 0.77**	**<0.001**
Bed with mattress/spring		**34 (5.3%)**	**14 (8.0%)**	**20 (4.3%)**		**0.38**	**0.18, 0.80**	**0.009**
Presence of water leaks	**631**	**101 (16%)**	**15 (8.8%)**	**86 (19%)**	**0.003**	**2.39**	**1.38, 4.42**	**0.003**
Sexual Vulnerabilities								
Knowledge of contraceptive methods	644							
Implant		**335 (52%)**	**106 (61%)**	**229 (49%)**	**0.008**	**0.62**	**0.44, 0.88**	**0.008**
Monthly injection		**447 (69%)**	**136 (78%)**	**311 (66%)**	**0.005**	**0.56**	**0.37, 0.84**	**0.006**
Pill		**302 (47%)**	**94 (54%)**	**208 (44%)**	**0.034**	**0.69**	**0.48, 0.97**	**0.035**
Morning pill		**202 (31%)**	**69 (39%)**	**133 (28%)**	**0.007**	**0.61**	**0.42, 0.88**	**0.007**
Intra uterine device		**547 (85%)**	**128 (73%)**	**419 (89%)**	**<0.001**	**3.08**	**1.97, 4.80**	**<0.001**
Male condom		**503 (78%)**	**115 (66%)**	**388 (83%)**	**<0.001**	**2.5**	**1.68, 3.70**	**<0.001**
Female condom		**534 (83%)**	**116 (66%)**	**418 (89%)**	**<0.001**	**4.17**	**2.72, 6.41**	**<0.001**
Calendar method		**526 (82%)**	**108 (62%)**	**418 (89%)**	**<0.001**	**5.08**	**3.35, 7.78**	**<0.001**
Amenorrhea method		**533 (83%)**	**112 (64%)**	**421 (90%)**	**<0.001**	**4.93**	**3.22, 7.61**	**<0.001**
Rhythm method		**531 (82%)**	**111 (63%)**	**420 (90%)**	**<0.001**	**4.94**	**3.23, 7.60**	**<0.001**
Withdrawal method		**531 (82%)**	**111 (63%)**	**420 (90%)**	**<0.001**	**4.94**	**3.23, 7.60**	**<0.001**
Traditional Method	**644**	**606(94%)**	**156(89%)**	**450(96%)**	**0.001**	**4.93**	**3.22, 7.61**	**<0.001**
Barrier Method	**644**	**553(86%)**	**122(70%)**	**431(92%)**	**<0.001**	**4.93**	**3.11, 7.87**	**<0.001**
Hormonal Method	**644**	**533(82%)**	**112(64%)**	**421(90%)**	**<0.001**	**2.88**	**1.48, 5.62**	**0.002**
Do you know any type of contraceptive method	**644**	**606 (94%)**	**156 (89%)**	**450 (96%)**	**0.001**	**2.88**	**1.48, 5.62**	**0.002**
Out of 11 how many do you know	**644**	**8 (7, 10)**	**8 (4, 11)**	**8 (7, 10)**	**0.021**	**1.12**	**1.07, 1.19**	**<0.001**
Do you use any form of contraception	644	534 (83%)	114 (65%)	420 (90%)	<0.001	4.59	2.99, 7.07	**<0.001**
HIV knowledge score	644							
Mean (SD)		0.64 (1.53)	0.74 (1.57)	0.61 (1.52)	0.068	0.95	0.85, 1.06	**0.3**
STI Knowledge	644							
Mean (SD)		0.11 (0.47)	0.17 (0.57)	0.09 (0.42)	0.044	0.74	0.52, 1.04	**0.075**
Number of Sexual Partners	644				0.05			
None		346 (54%)	83 (47%)	263 (56%)				**0.4**
One or more		298 (46%)	92 (53%)	206 (44%)		0.71	0.50, 1.00	**0.051**

Variable	N	Overall (N=644)	Previous Exposure (N=175)	Newly Reached (N=469)	p-value (Bivariate)	OR (unad-justed)	95% CI	p-value (Univariate)
Ever had an unplanned pregnancy	220	93 (42%)	28 (54%)	65 (39%)	0.053	0.54	0.29, 1.01	**0.055**
Migration Experiences								
Year of leaving Village based on ADDAD	630				0,4			**0.3**
Before 2011 (ADDAD)		16 (2.5%)	6 (3.4%)	10 (2.2%)	ref	ref	ref	**ref**
2011 and Above (After ADDAD)		614 (97%)	168 (97%)	446 (98%)		1.59	0.53, 4.36	**0.4**
Marriage Trousseau	**630**	**394 (63%)**	**123 (71%)**	**271 (59%)**	**0,009**	**0.58**	**0.40, 0.84**	**0.004**
Aid Family Financially	414	384 (93%)	111 (93%)	273 (93%)	0,9	1.05	0.45, 2.31	**0.9**
No Work in the Village	630	41 (6.5%)	7 (4.0%)	34 (7.5%)	0,12	1.92	0.89, 4.80	**0.12**
Self-Emancipation from Family	115	73 (63%)	34 (69%)	39 (59%)	0,3	0.64	0.29, 1.38	**0.3**
Poverty/Lack of Income	247	218 (88%)	53 (82%)	165 (91%)	0,05	2.2	0.97, 4.87	**0.054**
Other reason to leave village	630	46 (7.3%)	17 (9.8%)	29 (6.4%)	0,14	0.63	0.34, 1.19	**0.14**
Would a job have encouraged you to stay in your village	644							**0.3**
Unsure		349 (54%)	66 (38%)	283 (60%)		ref	ref	**ref**
Yes		**295 (46%)**	**109 (62%)**	**186 (40%)**		**0.4**	**0.28, 0.57**	**<0.001**
Plan to return to the village	**644**	**432 (67%)**	**138 (79%)**	**294 (63%)**		**0.45**	**0.30, 0.67**	**<0.001**
Experiences with Abuse and Violence								
History of Violence or transactional sex	**644**	**63 (9.8%)**	**25 (14%)**	**38 (8.1%)**	**0,019**	**0.53**	**0.31, 0.91**	**0.02**
History of Sexual Violence	644	42 (6.5%)	17 (9.7%)	25 (5.3%)	0,045	0.52	0.28, 1.01	**0.048**
History of Transactional Sex	644	22 (3.4%)	9 (5.1%)	13 (2.8%)	0,14	0.53	0.22, 1.30	**0.15**
History of Sexual Assault/Abuse	640	25 (3.9%)	11 (6.3%)	14 (3.0%)	0,054	0.46	0.20, 1.05	**0.056**
History of Physical/ Psychological Violence	644	88 (14%)	20 (11%)	68 (14%)	0,3	1.31	0.79, 2.29	**0.3**
History of Physical/ Psychological Violence by husband/in-laws	644	47 (7.3%)	18 (10%)	29 (6.2%)	0,075	0.57	0.31, 1.08	**0.078**
Violence by family/village	**644**	**35 (5.4%)**	**3 (1.7%)**	**32 (6.8%)**	**0,011**	**4.2**	**1.48, 17.6**	**0.019**
History of discrimination	644	15 (2.3%)	1 (0.6%)	14 (3.0%)	0,082	5.35	1.06, 97.4	**0.11**

[1] n (%); Median (Q1, Q3)
[2] Pearson's Chi-squared test; Fisher's exact test; Wilcoxon rank sum test
Abbreviations: CI = Confidence Interval, OR = Odds Ratio

Table 3 Comparing the newly reached DWs to the previously reached DWs using bivariate analysis

Employer Characteristics

A greater proportion of DWs with previous exposure to ADDAD reported having a work contract (43%) compared to newly reached DWs (1.5%). The newly reached DWs had significantly reduced odds of having a contract ($OR_{unadjusted}$ = 0.02, (0.01–0.05) p < 0.001). Additionally,

DWs with no previous exposure to ADDAD were less likely to be allowed off days during their work periods ($OR_{unadjusted}$ = 0.52(0.35–0.79) p = 0.002).

Employer-related vulnerabilities showed mixed results. Compared to the DWs who had been exposed to ADDAD previously, the newly reached DWs had 53% reduced odds of experiencing an employer's refusal to pay a salary ($OR_{unadjusted}$0.47; 0.35-0.81(p<0.005)), and these results are statistically significant. However, reports of violence by employers did not differ significantly (p > 0.05).

DWs workers who worked more than the 75th percentile of 105 hours weekly as observed in the population were more likely to be previously exposed when compared to the newly exposed DWs (OR = 0.53, 95% CI: 0.36–0.78).

Health Vulnerabilities and Perceptions

Perceptions of personal state of health showed slight significant difference between the two groups (p = 0.054). Compared to the DWs who had been exposed to ADDAD previously, the newly reached DWs have 2.17 increased odds of perceiving their personal state of health as excellent compared to those who perceived their personal state of health as bad (2.17; 1.10-4.19), and these results are statistically significant (p = 0.023). Compared to DWs who had been exposed to ADDAD previously, the newly reached DWs had 43% lower odds of reporting having a chronic disease (OR = 0.57(0.34–0.99) p = 0.041), and this result was statistically significant.

Occupational Vulnerabilities

Self-employment was significantly more common among newly reached DWs (16%) as opposed to the 8.0% among the previously reached DWs (p = 0.011). Compared to the DWs who had been exposed to ADDAD previously, the newly reached DWs had 2.15 higher odds of being self-employed compared to those who are not (OR = 2.15(1.22–4.08) p = 0.012). This association is statistically significant. Control over income varied between the two groups of DWs: compared to previously reached DWs (9.7%), newly reached DWs were significantly more likely to control their own income (23%). Compared to the previously reached DWs, the newly reached DWs had 2.81 increased odds of having control over their own income. (OR=2.81(1.67–5.00) p < 0.001;).

Most housekeeping tasks were similarly distributed across these (p > 0.05), except for cleaning (p = 0.002) and selling (p = 0.02). Compared to the DWs who had been exposed to ADDAD previously, the newly reached DWs have 48% reduced odds of cleaning while working as DWs (0.56(0.33-0.91) p = 0.02), and these results are statistically significant.

Compared to the DWs who had been exposed to ADDAD previously, the newly reached DWs have 3.08 increased odds of participating in Selling activities while working as DWs (3.08(1.31-9.06) p =0.020) and these results are statistically significant.

Bedding material at work differed significantly (p < 0.001) between the newly reached and previously reached DWS. Newly reached DWs (57%) were more likely to sleep on mats compared to previously reached DWs (41%), while mattresses and beds were more common among the previously reached. Compared to the DWs who had been exposed to ADDAD previously, the newly reached DWs had 46% reduced odds of sleeping on a mattress/armchair while living with their boss than sleeping on a mat (0.54(0.37-0.77) p < 0.001), and these results are statistically significant.

Compared to the DWs who had been exposed to ADDAD previously, the newly reached DWs have 62% reduced odds of sleeping on a bed with a mattress/spring while living with their boss than sleeping on a mat (OR = 0.38(0.18-0.80) p=0.009), and these results are statistically significant.

Sexual Vulnerabilities

Among the 11 recognized contraceptive methods, both previously and newly reached DWs (DWs) demonstrated knowledge of an average of 8 methods. However, the distribution of knowledge differed significantly between the groups: previously reached DWs had a narrower interquartile range (IQR: 7–10), while newly reached DWs exhibited a broader range (IQR: 4–11), suggesting greater variability in awareness. Despite the same mean, the newly reached group showed significantly higher overall knowledge (p < 0.001; OR: 1.07–1.19). There is some nuance to this result. Newly reached DWs demonstrated significantly higher knowledge and reported use of traditional contraceptive methods, including the rhythm method (OR = 4.94; 95% CI: 3.23–7.60; p < 0.001) and withdrawal (OR = 4.94; 95% CI: 3.23–7.60; p < 0.001). They also had increased odds of using barrier methods such as female condoms (OR = 4.17; 95% CI: 2.72–6.41) and male condoms (OR = 2.5; 95% CI: 1.68–3.70), both statistically significant. Previously reached DWs exhibited significantly greater awareness of specific hormonal methods. For instance, knowledge of the hormonal implant was higher among previously reached DWs (61%) compared to newly reached DWs (49%) (p < 0.05) (OR= 0.62(0.44, 0.88) pvalue = 0.008). Similarly, awareness of the monthly hormonal injection was 78% among previously reached DWs versus 66% among newly reached DWs (p < 0.05). The same trend was observed for oral contraceptive pills (54% vs. 44%) and emergency contraception or the "morning-after pill" (39% vs. 28%), both statistically significant (p < 0.05).

HIV and STI knowledge scores were low across both groups, with no statistically significant differences (HIV: p = 0.068; STI: p = 0.044). Mean STI knowledge scores were particularly poor: 0.64 (SD = 1.53) for HIV and 0.11 (SD = 0.47) for STIs. The newly reached DWs had 46% lower odds of reporting an unplanned pregnancy compared to previously reached DWs (p = 0.055), a marginally significant finding. Similarly, the number of sexual partners differed slightly between groups (p = 0.05), with previously reached DWs more likely to report multiple partners.

Migration Experiences

Most participants left their village after 2011 to come to Bamako before the conception of ADDAD, with no significant difference by group (p = 0.4). However, migration for marriage trousseau was significantly more common among previously reached DWs (71% vs. 59%; OR = 0.58 (0.40,0.84); p = 0.004). Other motivations, such as financial support or lack of village employment, did not differ significantly.

Experiences with Abuse and Violence

History of violence or transactional sex was significantly more common among the previously exposed (14% vs. 8.1%, p = 0.019; OR = 0.53, 95% CI: 0.31–0.91, p = 0.02). History of sexual violence was significantly less experienced by the newly reached compared to the previously reached (OR = 0.52, p = 0.048).

Other forms of abuse, including transactional sex and psychological violence, and a history of sexual violence were not significantly different between the two groups. However, violence by family or village was significantly more common among newly reached DWs (6.8%) compared to the previously reached (1.7%) (OR = 4.2, 95% CI: 1.48–17.6, p = 0.019).

Legend for Class Memberships

A total of 7 LCAs were conducted to identify distinct vulnerability profiles among the DWs across multiple thematic domains. The results the LCA indicating the classes across the domains in Table 4Summary of Latent Class Profiles and Key Indicators below.

Latent Class Profiles of Vulnerability Across Thematic Domains

Domain	Class proportions (%)	Label	Key Characteristics
Socioeconomic Indicators	Class 1 (75%)	Overworked and Under supported	No contracts, few off days, moderate income, long hours, poor sleeping conditions
	Class 2 (10.2%)	Formally Employed and Protected	Contracts, off days, good bedding, income via ADDAD, work fewer hours
	Class 3 (14%)	Independent but At-Risk	Self-employed, good sleeping conditions, control income, work fewer hours
Demographics	Class 1 (27%)	Young, Uneducated, Married	Mostly 20-29 years, uneducated, married
	Class 2 (72%)	Young Adolescents, Single	Under 15, mostly single, 33% educated
Occupational Vulnerabilities	Class 1 (78.9%)	Informal, Vulnerable Workers	No contracts, income controlled by others, long hours, basic bedding
	Class 2 (11.9%)	Contracted, Respected Workers	Contracts, income via ADDAD, best hygiene and employer respect
	Class 3 (9%)	Contracted, Abused Workers	Contracts, occupational abuse, poor work conditions, no off days
Migration Motivation Indicators	Class 1 (48%)	Long Term Motivations	Village to Bamako, poverty, no work in village
	Class 2 (51%)	Short Term Motivations (Finance Bridal Trousseau)	Came to finance bridal trousseau, few for self-emancipation also
Health Vulnerabilities	Class 1 (87%)	Generally Healthy Majority	Good perceived health, no chronic illness, low consultation rates, few recent infections
	Class 2 (13%)	Hidden Health Burdened	Poor health, chronic illness, low care access, untreated conditions
Access to Healthcare	Class 1 (12%)	Traditional Methods Users	Use traditional care, unsure where to go, access barriers
	Class 2 (87%)	Orthodox Healthcare Users	Use formal healthcare, no reported access difficulties
Mental Health	Class 1 (9.4%)	Mild Sleep Issues, Low Distress	Low psychological symptoms, moderate sleep issues, high sleep satisfaction
	Class 2 (18.7%)	High Distress and Sleep Problems	High anxiety and depression, poor sleep, daily functioning affected
	Class 3 (71.9%)	Healthy Sleep and Mood	No mental health symptoms, no sleep issues, high well-being
Sexual Health	Class 1 (42%)	High Awareness, High Disclosure	High contraceptive knowledge, STI symptoms, likely to disclose, low violence exposure
	Class 2 (32.5%)	Moderate Awareness, Low Risk	Good contraceptive knowledge, low STI symptoms, low violence exposure
	Class 3 (25%)	STI Symptoms, Mixed Knowledge	High STI symptoms, mixed HIV knowledge, low STI knowledge, some violence exposure

Table 4Summary of Latent Class Profiles and Key Indicators

Latent Class Analysis Bivariate Regressions

Characteristic	OR$_{unadjusted}$	95% CI	p-value
Occupational Vulnerabilities Profile			
1	Ref	Ref	
2	**0.01**	**0.00, 0.02**	**<0.001**
3	0.77	0.40, 1.39	0.4
Health Vulnerabilities Profile			
1	Ref	Ref	
2	0.59	0.20, 1.87	0.3
Healthcare Access Profile			
1	Ref	Ref	
2	0.85	0.48, 1.44	0.6
Mental Health Vulnerabilities Profile			
3	Ref	Ref	
1	**0.59**	**0.34, 1.04**	**0.063**
2	0.71	0.46, 1.11	0.13
Migration Experience Profile			
1	Ref	Ref	
2	**0.58**	**0.40, 0.83**	**0.003**
Sexual Vulnerabilities Profile			
1	Ref	Ref	
2	0.33	0.01, 4.05	0.4
3	0.25	0.01, 3.12	0.3
Demographic Profile			
1	Ref	Ref	
2	**0.65**	**0.42, 0.97**	**0.042**

Table 5 Bivariate Logistic Regressions with the LCA Explanatory Variables

All significant class profiles were retained in the final model except the occupational vulnerabilities profile due to multicollinearity with other variables as shown below.

Factors Associated with being Newly Reached by ADDAD through the 2DM2K Project

Characteristic	OR$_{adjusted}$	95% CI	p-value
History of Sexual Violence	0.76	0.34, 1.73	0.5
Violence by family/village	**3.11**	**1.05, 13.4**	**0.071**
Ethnicity			
Bambara	Ref	Ref	Ref
Peulh	1.4	0.70, 3.00	0.4
Dogon	1.74	0.88, 3.62	0.12
Bozo	**0.39**	**0.17, 0.89**	**0.025**
Other	1.45	0.85, 2.57	0.2
STI Knowledge	0.78	0.50, 1.25	0.3
HIV Knowledge	0.92	0.80, 1.08	0.3
Number of Sexual Partners			
None	Ref	Ref	Ref
One or more	**0.56**	**0.34, 0.92**	**0.021**
Are you Self Employed?			
No	Ref	Ref	Ref
Yes	1.09	0.36, 3.26	0.9
Are you Allowed Off Days between work			
No	Ref	Ref	Ref
Yes	**0.32**	**0.19, 0.55**	**<0.001**
Activities as a housekeeper			
Cleaning	**0.29**	**0.12, 0.71**	**0.008**
Selling	2.69	1.00, 9.00	0.073
Score for treatment during medical consultation	**1.1**	**1.03, 1.17**	**0.003**
Contraceptive Methods			
Hormonal Method	0.64	0.25, 1.66	0.4
Barrier Method	**3.06**	**1.15, 8.20**	**0.025**
Traditional Method	2.12	0.91, 4.93	0.08
Migration Motivations Profile			
1(Long Term Motivations)	Ref	Ref	Ref
2(Short Term Motivations) **	**0.57**	**0.35, 0.91**	**0.019**
Mental Health Vulnerabilities Profile			
3(Healthy Sleep and Mood)	Ref	Ref	Ref
1(High Distress and Sleep Problems)	0.98	0.49, 2.02	>0.9
2(Mild Sleep Issues, Low Distress)	1.02	0.61, 1.74	>0.9
Demographic Profile			
1(Young, Uneducated, Married)	Ref	Ref	Ref
2(Young Adolescents, Single)	0.57	0.28, 1.15	0.12

Abbreviations: CI = Confidence Interval, OR = Odds Ratio; **Bridal Trousseau

Table 6 Multivariate Logistic Regression Results Predicting Newly reached DWs compared to Previously Reached DWs by Latent Classes and Covariates

Compared to the previously reached DWs, the newly reached DWs had 3.11 (1.05, 13.4) times increased odds(adjusted) of experiencing violence by their family or in their village and these results are marginally significant indicative of a trend (p = 0.071).

DWs from the Bozo tribe had 61% reduced odds of being previously reached compared to the Bambara tribe (OR_{adj} = 0.39 (0.17, 0.89), p = 0.025).

Having more than one sex partner in the lifetime was significantly associated with having lower odds of being newly reached as a domestic worker (OR_{adj} = 0.56 (0.34, 0.92), p = 0.021). Compared to the previously reached DWs, the newly reached workers were less likely to have off days during the week (OR_{adj} = 0.32(0.19, 0.55) p <0.001).

The DWs that did more cleaning work were 71% less likely to be newly reached compared to the previously reached DWs (OR_{adj} = 0.29(0.12, 0.71), p = 0.008). For each unit increase in score for treatment during medical consultation with ADDAD, there was 1.1 increased odds of being newly reached compared to the previously reached DWs (OR_{adj} = 1.1(1.03, 1.17), p = 0.003).

Compared to the previously reached DWs, the newly reached DWs had 3.06 increased odds of knowing and using the Barrier methods compared to the Hormonal Methods (OR_{adj} = 3.06(1.15, 8.20), p = 0.003). The traditional method was not statistically significant however showed a trend that newly reached tended to make use of this method as well (OR_{adj} = 2.12 (0.91–4.93), p = *0.08*).

With the identified LCA profile, compared to the previously reached DWs, the DWs who fell into class 2 (Short term motivations for migration especially the bridal Trousseau) under the Migration class profile were 43% less likely to be newly reached (OR_{adj} = 0.57 (0.35, 0.91); p = 0.019) compared to class 1 (long term migration motivations).

Discussion

This study identified a new profile of domestic worker that was reached by ADDAD as a result of the 2DM2K project. This new profile highlights certain experiences like violence, occupational conditions and reproductive health that are indicative of opportunities for more targeted approaches and inclusive strategies for marginalized groups.

The newly reached were less likely to engage in cleaning as part of their job description compared to the previously reached workers. This is no surprise because DWs are typically engaged in multiple activities that depend on the household that they cater to. The trend can be country specific as is observed in countries like Brazil, Ecuador, the Dominican Republic, Jamaica, Serbia and the United States where about 15%-45% of DWs are caregivers as opposed to cleaners.[55]

ADDAD being was able to reach DWs who had experienced a different type of violence than the previously reached DWs is indicative of ADDAD being to reach more vulnerable populations through the 2DM2K project. Prior to 2DM2K, ADDAD had already been instrumental in reaching DW in need pf legal support and victims of other forms of abuse but now ADDAD has been able to reach victims of familial and community abuse which were perhaps harder to reach, and these activities encouraged these vulnerable women to come forward. There is a known intersectionality between inequities and domestic work. Victims of violence usually are less likely to seek help[56] and Rohn and Tenkorang (2022) found that victims of violence in Ghana preferred informal support as opposed to formal.[57] This is supported by Murphy, Ellsberg, & Contreras (2020) who found that victims of physical violence tended toward formal help (OR.adj: 3.6; (1.2–10.6); p value <0 .05). ADDAD although formal, is led and managed by former DWs and we can infer that this has built a foundation of trust that bypasses the formal structure of the organization allowing for access to harder-to-reach DWs.

Domestic work is a social issue with some tribes being very represented in the sector. It is no surprise that the Bozo tribe is underrepresented in the new profile of DWs reached by through the 2DM2K project. Literature suggests that help and health seeking behaviours are associated with ethnic background. Hulley et al. (2022) found that cultural issues such as language barriers, family systems, cultural expectations and religion could interfere with help seeking behaviours.[58] This may not necessarily be the case here because most people in Bamako speak French or Bambara (80%)[59,60] and ADDAD's activities were conducted in language and culturally sensitive manner.

The newly reached workers were less likely to have off days during the week compared to the previously reached DWs which suggests that the newly reached DWs might be facing more

occupational vulnerabilities. Having off days, is linked with formal arrangements of employment such as having contracts. The newly reached DWs had significantly reduced odds of having a contract compared to the previously reached. Additionally, Arcand (2020) found that having off days and working fewer hours is associated with having a live-out arrangement with the employer which might also explain why this difference exists.[61] This is interesting because we found that the newly reached DWs typically worked fewer hours than the previously reached DWs.

Regarding sexual vulnerabilities especially contraceptive use, we found that the newly reached DWs favoured the barrier method like male and female condoms over the hormonal. The newly reached had an increased odds of being married compared to the previously reached DWs. Unsurprisingly this is supported by Ochako, Mbondo, Aloo, Kaimenyi, Thompson, Temmerman, and Kays (2015) who found that hesitancy in the uptake of hormonal contraception was due to a fear of infertility and other side effects like bleeding[62]. Additionally, Sheff, Jackson, Kanté, Rusibamayila, and Phillips (2019) found that spousal approval was the main motivation for uptake and use of contraception as opposed to community-based interventions.[63] Therefore, if ADDAD was to improve the uptake of contraception of any kind especially among married women, the involvement of spouses cannot be overemphasized. When comparing the profiles, we found that individuals in Class 2 characterized by short-term migration motivations mainly financing a bridal trousseau were less likely to be newly reached by ADDAD compared to those in Class 1, who migrated for long-term economic reasons such as poverty or lack of work in their village. This suggests that short-term migrants may be less involved with outreach systems but then again, this might also just be as result of the fact that the newly reached population were more likely to be married compared to the previously reached. A similar occurrence was observed by Van Hear, Bakewell, and Long (2012) who found that men in Bangladesh were motivated to migrate and work away from home in order to improve their marriage prospects.[64] This is like what was observed in the DWs with young women migrating to finance the bridal trousseaux. This contrast likely reflects cultural differences in gender roles and expectations surrounding marriage and economic contribution.

Strengths and Limitations

The study had a large sample size of 644 DWs which allowed for sufficient power for meaningful analysis and insights. The study integrated a community based participatory approach which allowed for trust building with a traditionally hard-to-reach population. The integrated approach to with the addition of health screenings in addition to the community outreach ensured enhanced participation added social value to the research.

The study employed a quantitative design with structured questionnaires, supported by rigorous statistical analyses including logistic regression and Latent Class Analysis (LCA). These methods enabled the identification of nuanced subgroups and vulnerability profiles that would have been overlooked using only basic descriptive statistics.

Despite the strengths of this study, it is not without limitations. The study employed cross-sectional research design and as such provides a snapshot of newly and previously reached DWs experiences but lacks follow-up data to assess the sustained impact of ADDAD's interventions over time.

Additionally, the study relied on self-reported data which is subject to bias. The DWs might have underreported certain experiences pertaining to sensitive subjects like sexual assault or STIs.

Furthermore, DWs are a hard-to-reach vulnerable population and there might have been a systematic exclusion of DWs who live in their employers' households or those who were unable to participate due employer/other restrictions.

Recommendations

Therefore, based on the findings of this study, the following recommendations are intended to enhance the effectiveness of ADDAD and other CBOs that work with marginalized populations. These strategies aim to improve access to health and social protection services for those hard-to-reach vulnerable populations.

Since ethnicity has shown once again to be integral in community-based interventions involving DWs, interventions should be tailored to reach more ethnically diverse groups.

This study also found that a lot of the DWs were working over 60hours a week which is higher than is allowed by the Malian labour code, this is a call for policy review and implementation to ensure that vulnerable populations such as these are not being exploited.

The newly reached reported having received better medical treatment than the previously reached, therefore more health focused collaborations like with the ANRS should be encouraged because DWs are very vulnerable health wise. Additionally, since the newly reached DWs favour barrier and traditional methods of contraception, more evidence-based activities or interventions discussing sexual and reproductive health should be organised for DWs and their spouses/partners to increase awareness while respecting individual preferences and cultural contexts.

The overarching recommendation is that this research has brought to light the existence of a new profile of DWs, and this data can be used to develop risk profiles to which interventions can be tailored by ADDAD and other domestic worker focused CBOs.

Conclusion

The results of this study underscore the need for more community-based action targeted at vulnerable and hard-to-reach groups like domestic workers in Mali. The study was able to identify a new profile of DWs in the newly reached DWs and as such, not only can we conclude that the 2DM2K was successful in helping ADDAD reach a new profile of domestic worker that ADDAD would have not reached before, but we can also emphasize on the need for more community-based actions and collaborations. The study has brought to light some of the vulnerabilities faced by DWs in Mali and has created an evidence-base for more targeted approached towards DWs in Mali and perhaps can be applied to similar countries outside of Mali. This study highlights the need for more longitudinal studies of similar nature to enable ADDAD and other CBOs to measure the true efficacy of their programs over time to continue building the evidence-base for more targeted approaches to community-based initiatives involving DWs.

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Résumé en français

Santé communautaire pour les jeunes travailleurs domestiques difficiles à atteindre au Mali

Nombre de mots: 298

Introduction

Les travailleurs domestiques (TDs) migrants constituent une population vulnérable en termes de santé et de protection sociale, et difficile à atteindre par les associations.

Objectif de l'étude

Cette étude évalue l'efficacité d'une initiative communautaire mise en œuvre par l'Association de Défense des Droits des Aides Ménagères et Domestiques (ADDAD) à Bamako, au Mali, en collaboration avec ARCAD Santé PLUS, afin d'atteindre de nouveaux profils de travailleurs domestiques.

Méthodes utilisées

En 2023, à Bamako, au Mali, les bénéficiaires de l'intervention ont été invités à participer à l'enquête. Des données sur leurs caractéristiques sociodémographiques, leurs conditions de travail et leurs vulnérabilités ont été collectées à l'aide d'un questionnaire transversal. Les caractéristiques des TDs anciennement et nouvellement affiliés à ADDAD ont été comparées dans des analyses bivariées. Les profils de vulnérabilité ont été estimés à l'aide d'une analyse des classes latentes. Un modèle de régression logistique a permis d'estimer si les personnes nouvellement affiliées avaient des probabilités plus élevées d'être vulnérables en fonction de différents thèmes.

Résultats

Sur les 644 TDs, 469 (73%) étaient nouvellement affiliés et 175 (27%) étaient précédemment affiliés à ADDAD. La plupart des TDs nouvellement affiliés étaient moins susceptibles d'avoir un contrat de travail formel (OR = 0,02(0,01-0,05) ; p<0,001) malgré la loi. Par rapport aux TDs précédemment affiliés, les nouveaux affiliés étaient moins susceptibles d'avoir des jours de congé (ORadj=0,32(0,19-0,55) ; p<0,001), d'avoir des motivations de migration à court terme (ORadj=0,57(0,35,0,91) ; p=0,019), et avaient tendance à être victimes de violence domestique (ORadj=3,11(1,05-13,4) ; p=0,071).

Conclusion

L'étude conclut que le projet a effectivement étendu la portée d'ADDAD, en atteignant de nouveaux profils de TDs vulnérables. Elle souligne la valeur des approches communautaires pour améliorer l'accès aux services essentiels et renforcer la protection sociale des TDs au Mali.

Mots clés : *approche communautaire, travailleurs domestiques, vulnérabilités*