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**Original Research Article**

# Human resource challenges in community health surveys: insights from a national household survey in India

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## ABSTRACT

**Background:** India with geographically diverse and malaria-endemic regions, extensive community health survey becomes essential to generate critical data for public health planning. However, their success completely relies on the team efforts of field data collectors working across socially heterogenous settings, and the institutional teams for recruiting, training and retaining the workforce. Moreover, both field workforce and recruiters face major operational, logistical, and supervisory demands while implementing such high-volume household surveys across remote terrain, dispersed settlements, and culturally diverse communities. However, the effectiveness of these human resource systems working under real-world complex conditions ultimately becomes the strength of these large-scale surveys as it requires to navigate field realities challenges while maintain the workforce retention, protocol adherence, and high data quality at this scale.

**Methods:** A cross-sectional descriptive study was conducted among the staffs working in the multi-state Indian Council of Medical Research-National Institute of Malaria Research (ICMR-NIMR) Household Survey Project surveying 37849 households across diverse geographic settings in India. Structured and pre-tested questionnaire was used to collect data. Descriptive statistics were used to summarise the key findings.

**Results:** Across multiple malaria-endemic states, 23 field data collectors were deployed with high level of training coverage, supervision and team cohesion. Although there was extended working hours and logistical demands, 78.3% reported to complete their full contract tenure reflecting the workforce stability and strong retention.

**Conclusions:** Overall findings suggest that in geographically and operationally complex setting with large population of 37849 households, structured human resource systems effectively sustained motivation, performance and data collection quality.

**Keywords:** Community health worker, Data collections, Health surveys, Malaria, Personnel management

## INTRODUCTION

In India, where diverse population and complex health profiles require accurate representative data, large-scale community health surveys becomes essential tools in public health research and policy planning.[1] Such health surveys monitor trends in health indicators, guides allocation of resources, inform priority setting, and evaluate program effectiveness. However, there are various human resource challenges encountered especially during field data collection which are under-reported and shadowed by the frequently discussed topic

in literature like methodological rigor in sampling and analysis.[2] Thus, its crucial to understand these challenges because the workforce implementing the survey directly influences the quality and credibility of population health data.

In extensive health surveys, filed investigators and data collectors works as the primary connection between research protocols and respondents. In addition, their capacity, motivation, and working condition significantly influences the completeness and accuracy of data collected.[3] Yet, several obstacles slows down the performance of the workforce.[4] Across the globe, health system struggles with trained workforce shortage, unequal staff distribution and retention, particularly in rural or remote settings, issues that also affect survey workforce.[5] In India also, scarcity and unequal distribution of human resource across states and district has been documented in broad health research system, focusing on persistent challenges like recruitment, training, and workforce governance that affects rural and underserved areas disproportionately.[6,7] Moreover, there are additional operational challenges during field data collection in surveys that goes beyond workforce shortages. These include logistical challenges such as extensive travel to hard-to-reach communities, long working hours, and limited access to communication, increasing physical and administrative strain on data collectors.[8,9] In addition, the complexity of coordinated field activities under diverse cultural, linguistic, and geographic conditions, can extend the timeliness and data completeness.

Training and supervision represent another layer of human resource challenge. Adequate training enhances the competence and confidence of data collectors, yet studies on health data systems note frequent gaps in formal training, supervision quality, and ongoing mentorship.[10] In low-resource work environment, supervisors may face geographic isolation and administrative burdens that can reduce their support for field teams affecting the staff morale and consistency in data quality.[11,12]

Furthermore, human resource challenges do not limit on number and skills of worker, but also depends on motivational and system-level factors. The workforce management and health leadership research focuses on the importance of supportive work organization, clarity on role descriptions and work recognition ensuring staff retention and job satisfaction.[13] These factors are especially very helpful in survey settings as the worker operate under contractual, short-term arrangements with variable support. Apart from field workforce, recruiters also face multiple challenges while managing field team for such large community health surveys. The recruiters need to identify suitable candidates within limited timelines, coordinate training and deployment across geographically dispersed sites and ensures constant supervision and protocol adherence.[14] Also, they manages logistics, staff welfare, female health worker safety, and workforce retention, that further complicates the workforce management, needing to balance administrative demands and ensuring data quality at the same time with ethical responsibilities.[15]

The Global strategy on human resources for health workforce 2030, suggests that strengthening human resources, improving workforce management, and ensuring supportive working condition are essential to achieve effective health system and sustainable public health outcomes.[16] Despite this, there are insufficient documentation of operational challenges related to recruitment, retention, and field-level workforce management in large-scale survey, particularly in the Indian context. Thus, this study aims to (i) evaluation of training effectiveness for field data collectors, (ii) assess supervision, support and team dynamics for job motivation and satisfaction, (iii) identify HR-related logistical and safety challenges, and (iv) identify evidence-based, HR strategies replicable to improve staff retention and survey performance. The findings from this study will help in development of more supportive and resilient fieldwork system strengthening data quality and sustainability of future malaria surveys in endemic settings.

## METHODS

### *Study design and setting*

This cross-sectional descriptive study was conducted December 2023 till February 2024 among the staffs working in the ICMR-National Institute of Malaria Research, Household Survey Project. The project was implemented across multiple states in India that includes Arunachal Pradesh, Assam, Delhi, Jharkhand, Madhya Pradesh, Mizoram, Nagaland, Odisha, and Tripura, covering 37849 households, representing a diverse range of operational and field environments.

### *Study populations*

The study population includes project assistants, field technicians, data entry operators, who were directly involved in field operations and project activities across the participating states.

### *Data collection methods and quality assurance*

Structured questionnaire was developed and administered through Google Forms for data collection. All eligible staff members received the survey link electronically allowing them to complete the questionnaire at their convenience. The questionnaire comprises both closed and open-ended questions covering socio-demographic characteristics, employement details, training experiences, supervisory support, operational challenges, safety, and satisfaction.

***Data processing and statistical analysis***

Survey responses were exported from Google Forms into Microsoft Excel for data cleaning and coding. In addition, data were checked for completeness and consistency. Descriptive statistics were used to summarise the variables in frequencies and percentage through IBM SPSS (version 29).

## RESULTS

The study analysed total of 23 field staffs out of which 13 (56.5%) are aged 25-30 years and 10 (43.5%) aged 20-25 years. Majority were male, 19 (82.6%), and unmarried, 21 (91.3%). Educational qualification was good, with 11 (47.8%) holding graduate degrees, 9 (39.1%) postgraduate degrees, and 3 (13.0%) completing higher secondary education, working as Project Technician - 1 (PT-1) personnel, 12 (52.2%), followed by PT-3, 7 (30.4%), and project assistants, 4 (17.4%). Most participants had substantial field exposure, with 15 (65.2%) working on the project for 3-6 months and 8 (34.8%) for 1-3 months. Deployment spanned multiple malaria-endemic states, including Assam, 5 (21.7%); Jharkhand, 4 (17.4%); Madhya Pradesh, 4 (17.4%); Tripura, 4 (17.4%); Arunachal Pradesh, 2 (8.7%); Mizoram, 2 (8.7%); Nagaland, 1 (4.3%); and Odisha, 1 (4.3%). A large majority successfully completed their full contract tenure, 18 (78.3%), indicating strong retention and workforce stability.

***Evaluation of training effectiveness for field data collectors***

Field data collectors demonstrated continuity of work in good proportion with 18 participants (78.3%) completing their full contract tenure, indicating workforce stability. All of them reported receiving initial training prior to field deployment. Hybrid training was the most commonly reported format, received by 11 participants (47.8%). High training satisfaction was noted, with 15 respondents (65.2%) reporting being very satisfied and 4 (17.4%) satisfied. Among those who required additional clarification after initiating field activities, 13 participants (56.5%) reported receiving the necessary support, reflecting ongoing training responsiveness during field implementation (Table 1).

***Assessment of supervision, institutional support, and team dynamics in relation to motivation and job satisfaction***

Most of the participants were positive about supervision and team dynamics as reported very good by 14 respondents (60.9%), along with conflict-handling abilities were also assessed to be very good by 13 (56.5%) participants. Communication between supervisors and field teams was assessed to be positive. Project team leaders' abilities received favorable ratings. Most field staff felt appreciated by their supervisors (19; 82.6%). Management skills of the investigative leadership (Principal Investigator and Co-Principal Investigator) were rated as very good by 15 respondents (65.2%). Teamwork within the institution was rated as very good by 12 participants (52.2%). Assistance from co-workers was reported as always available (60.9%) and frequently available by 6 (26.1%). Respect within the workplace was evident, with co-workers' respect rated as very good by 10 participants (43.5%), supervisors' respect for opinions rated as very satisfactory by 11 (47.8%), and involvement in study planning rated as very satisfactory by 13 respondents (56.5%) (Table 2).

**Table 1: Training coverage, mode, and perceived adequacy among field data collectors (n=23).**

| Indicator | Category | Number (%) |
|---|---|---|
| **Received initial training** | Yes | 22 (95.7) |
| | No | 1 (4.3) |
| **Mode of training** | Hybrid (online + offline) | 11 (47.8) |
| | Offline (in-person) | 8 (34.8) |
| | Online only | 3 (13.0) |
| **Satisfaction with training** | Very satisfied | 15 (65.2) |
| | Satisfied | 4 (17.4) |
| | Neutral | 2 (8.7) |
| | Very dissatisfied | 2 (8.7) |
| **Felt need for additional training** | Yes | 16 (69.6) |
| **Received additional training/support** | Yes | 13 (56.5) |
| | No | 4 (17.4) |
| | Not required | 6 (26.1) |

***Identification of HR-related logistical and safety conditions affecting fieldwork***

Fieldwork demands were substantial, with 13 respondents reporting working more than 8 hours per day. Satisfaction with equipment and tools was high. Transportation arrangements were viewed positively, with 9 participants (39.1%) satisfied and 4 (17.4%) very satisfied. POL reimbursement was the most commonly reported transportation support, utilized by 15 respondents (65.2%). Perceived safety during fieldwork was rated as satisfactory by 10 participants (43.5%) and very satisfactory by 5 (21.7%). Mobile network connectivity was rated as very good by 6 respondents (26.1%). Availability of hygienic food and drinking water was rated as good or very good by 6 participants (26.1%). Health challenges during fieldwork were not experienced by 10 respondents (43.5%), and language or cultural barriers did not affect work for 10 participants (43.5%). Community-level support was strong, with assistance from ASHA workers or community volunteers reported by 21 respondents (91.3%), and honoraria provided to ASHAs in 18 cases (78.3%). Comfort in reporting gender-specific challenges was reported by 15 participants (65.2%), adequate washroom facilities were

reported by 12 (52.2%), and most participants (14; 60.9%) reported never feeling uneasy about safety at work (Table 3).

**Table 2: Supervision quality, institutional support, and team dynamics (n=23).**

| Indicator | Category | Number (%) |
|---|---|---|
| **Supervisor management skills** | Very good | 14 (60.9) |
| | Good | 6 (26.1) |
| **Supervisor conflict management** | Very good | 13 (56.5) |
| | Good | 6 (26.1) |
| **Supervisor communication** | Very good | 14 (60.9) |
| | Good | 5 (21.7) |
| **Project team leader effectiveness** | Very good | 11 (47.8) |
| | Good | 7 (30.4) |
| **Received adequate information from supervisors** | Yes | 21 (91.3) |
| **Felt appreciated by supervisors** | Yes | 19 (82.6) |
| **PI/Co-PI management skills** | Very good | 15 (65.2) |
| | Good | 5 (21.7) |
| **Assistance from co-workers** | Always available | 14 (60.9) |
| | Frequently available | 6 (26.1) |
| **Teamwork within institution** | Very good | 12 (52.2) |
| | Good | 7 (30.4) |

***Evidence to inform replicable human resource strategies for staff retention and survey performance***

Overall satisfaction across compensation, work environment, safety, and team dynamics were high. Salary satisfaction was reported by 11 participants (47.8%), with 2 (8.7%) reporting very high satisfaction. The overtime compensation system was viewed favorably by 12 respondents (52.1%). Positive interpersonal dynamics were evident, with respect from co-workers rated as very good by 10 participants (43.5%) and good by 9 (39.1%). Assistance from colleagues was reported as always available by 14 respondents (60.9%) and frequently available by 6 (26.1%). Teamwork within the institution was rated as very good by 12 participants (52.2%) and good by 7 (30.4%). Involvement in study planning was rated as very satisfied by 13 respondents (56.5%) and satisfied by 6 (26.1%). Respect for opinions from both supervisors and co-workers was widely reported. Supportive workplace conditions were further reflected by comfort in reporting gender-specific challenges (15; 65.2%), adequate washroom facilities (12; 52.2%), and a sense of safety at work, with 14 participants (60.9%) reporting never feeling uneasy. The work environment met expectations for most respondents, with 13 (56.5%) rating it as very good and 8 (34.8%) as good. Overall field experience satisfaction was high, with most participants assigning scores between 8 and 10 on a 10-point scale (Table 4).

**Table 3: Logistical support, workload, and safety conditions during fieldwork (n=23).**

| Indicator | Category | Number (%) |
|---|---|---|
| **Daily commute time** | ≥2 hours | 18 (78.2) |
| **Daily working hours** | >8 hours | 13 (56.5) |
| **Accommodation arrangement** | Self-arranged | 17 (73.9) |
| **Satisfaction with accommodation** | Satisfied/very satisfied | 10 (43.4) |
| **Transport support** | POL reimbursement | 15 (65.2) |
| **Satisfaction with transport** | Satisfied/very satisfied | 13 (56.5) |
| **Satisfaction with safety measures** | Satisfied/very satisfied | 15 (65.2) |
| **Comfortable reporting gender-specific issues** | Yes | 15 (65.2) |
| **Adequate washroom facilities** | Yes | 12 (52.2) |
| **Never felt uneasy/ unsafe at work** | Yes | 14 (60.9) |
| **Faced health challenges during fieldwork** | Yes | 13 (56.5) |
| **Language/cultural barriers encountered** | Yes | 13 (56.5) |
| **Support from ASHA/volunteers** | Yes | 21 (91.3) |

**Table 4: Evidence on human resource management strategies.**

| Indicator | Category | Number (%) |
|---|---|---|
| **Salary satisfaction** | Satisfied | 11 (47.8) |
| | Very satisfied | 2 (8.7) |
| **Overtime compensation system** | Viewed favorably | 12 (52.1) |
| **Respect from co-workers** | Very good | 10 (43.5) |
| | Good | 9 (39.1) |
| **Involvement in study planning** | Very satisfied | 13 (56.5) |
| | Satisfied | 6 (26.1) |
| **Respect for opinions (supervisors and peers)** | Yes | 100 |
| **Work environment rating** | Very good | 13 (56.5) |
| | Good | 8 (34.8) |
| **Overall field experience score** | 8-10 (out of 10) | Majority |
| **Completed full contract tenure** | Yes | 18 (78.3) |

## DISCUSSION

This cross-sectional study among field data collectors of the ICMR-NIMR Household Survey Project demonstrated high levels of training coverage,

supervisory support, team cohesion, and overall job satisfaction. Despite operational challenges such as long working hours, extended commute times, language and cultural barriers, and field-related health concerns, retention was strong, with 78.3% completing their full contract tenure. These findings suggest that structured training, supportive supervision, and positive team dynamics contributed significantly to workforce stability in a multi-state, malaria-endemic operational context.

This study shows high training coverage and overall job satisfaction suggesting that structured and flexible training approaches enhance preparedness and confidence prior to field deployment. The similar study from global context also observes that opportunities for training and professional development significantly reduced turnover intention among health worker.[17] In addition, the other global study shows that continuous training and mentorship improves the retention even in remote health facilities.[18] The high satisfaction in this study may therefore reflect the positive role of structured training in building competence and motivation. Moreover, Supervisory management and communication were rated highly in our study, with most participants feeling appreciated and well informed, suggesting that supportive leadership strengthens morale and organizational commitment. Similar findings reported by study from Ethiopia that shows respect and supportive supervision are the key non-financial drivers of retention among the community health workers.[19] The other study also show that management quality significantly influences job satisfaction among rural health extension workers.[20] These findings highlight the essential leadership roles in sustaining field teams. Furthermore, the study highly focuses on team cohesion, mutual respect, and involvement in study planning, indicating that participatory environment enhances the professional identity and ownership. This aligns with the other study that suggest organizational culture and supportive workplace act as motivational factor in LMICs demonstrating that positive organizational environment influences the morale and performance of provider.[21,22] This study shows more than half of participants reporting for extended working hours and operational complexities that come with deployment in multi-state field that includes adaptation to unfamiliar terrain, changing infrastructure and diverse community dynamics. Despite these demands and burden, the study shows high satisfaction and retention of workforce suggesting institutional support mechanisms effectively mitigated field-level stressors.[23] In contrast, the study from low-middle income countries reported high levels of burnout among frontline primary healthcare providers in LMICs, particularly in settings with heavy workloads and limited systemic support.[24,25] The comparatively positive outcomes in our study may be attributed to structured supervision, transport reimbursement systems, and strong community-level collaboration. The strong support from ASHA workers and community volunteers reflects effective local health system integration and likely enhanced community engagement. In tribal and hard-to-reach areas where initial hesitancy toward external surveys may exist, the involvement of trusted local ASHAs likely strengthened community trust, facilitated household access, and improved participation, thereby supporting smooth field implementation and data quality. This approach aligns with principles of Rapid Rural Appraisal, which emphasize leveraging local knowledge and community-based facilitators to enhance contextual understanding and program implementation in rural and underserved settings.[26] In contrast, the study from Africa suggests that deployment in remote and culturally diverse setting often causes loss of field staffs due to professional isolation and contextual challenged.[27] This study suggest that structured community engagement and local collaboration can counteract these risks and promote retention even in heterogeneous regions. Although salary satisfaction was moderate in this study, overall job satisfaction remained high, suggesting that non-monetary motivators played a significant role. This aligns with findings for previous study showing that financial incentives are not insufficient if there is no recognition, supportive supervision and career development opportunities.[28] In this study, respect for opinions, participatory planning, and positive team relationships likely compensated for financial limitations.

The reliance on self-reported responses from the data collectors and relatively small sample size may limit the generalizability of the findings of this study. However, the study provides valuable insights into operational factors such as workforce satisfaction and retention in community health surveys.

## CONCLUSION

Overall findings of this study suggest that large multi-state health survey projects covering 37849 households can successfully retain the young and mobile field staff by implementing structured hybrid training, supportive supervision, participatory management, assistance in logistics and gender-sensitive reporting system. In vast geographic regions with linguistic and cultural differences, the good leadership and responsiveness from institution play a critical role in sustaining workforce and high-quality data collection. The finding highlights the importance of non-financial factors such as positive team dynamics, support, recognition and community engagement in workforce stability. In addition, this study offers practical insights for planning and managing large-scale community health surveys in India and other low and middle-income countries.

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