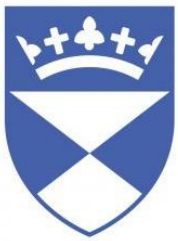

University of Dundee

An Exploration into the Barriers and Facilitators of Improving Child Health Outcomes in Rural Tea Gardens in India

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List of Abbreviations

ANM: Auxiliary Nurse Midwife

ASHA: Accredited Social Health Activist

CHO: Community Health Officer

CINI: Child In Need Institute/ India

FAO: Food and Agricultural Organisation

ICDS: Integrated Child Development Services

LMIC: Low- and Middle-Income Country

NFHS: National Family Health Survey

NGO: Non-Governmental Organisation

NRC: Nutrition Rehabilitation Centre

OOP: Out Of Pocket

SAM: Severe Acute Malnutrition/ Severely Acutely Malnourished

SDG: Sustainable Development Goal

UNICEF: United Nations International Children’s Emergency Fund

WHO: World Health Organisation

Dedication

This project is dedicated to the resilient tea garden communities, whose voices deserve to be heard and supported.

Acknowledgements

I would like to begin by expressing my heartfelt thanks to all the participants who took part in this research. Your insights were profound, and your openness to share your experiences made this project possible.

A sincere thank you to CINI and my locality supervisor, Dr Paige Linnell, for helping to facilitate me in carrying out this research. Your collaboration was invaluable.

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Declaration

I, Anna Ramsay, have read the BMSc dissertation and course regulations and shall abide by them.

Candidate's signature

23/04/2025

Date

Executive Summary

Introduction

Tea garden communities are a marginalised population that face many challenges in health outcomes (1). Within this population, children are more likely to be malnourished and are vulnerable to preventable diseases (1) .

Tea gardens are heavily reliant on the women work force, who spend long hours each day plucking tea leaves (2). Work and living are closely related, with the majority of workers choosing to reside within the tea garden community. Conditions within tea gardens are usually found to be suboptimal, with basic facilities such as housing and water provided by the managers (3) . Subsequently, there is a lack of health facilities available to provide adequate health care to the populations living on these tea gardens (3).

Child In Need Institute is a Non-Governmental Organisation, whose branch of work focusses on improving the nutrition, education and health of women and children in these tea gardens (4).

This research aims to explore the barriers and facilitators for improving child health outcomes in these rural tea gardens. In addition to this it also aims to assess how CINI's interventions and practices in improving child health compare to global health standards.

Literature Review

Tea garden communities are among the most marginalised and underserved populations in the world (5) . Child health indicators in these communities are consistently poorer compared to the national averages, with undernutrition, anaemia and low birth weight commonly reported (6).

Children in tea gardens are particularly vulnerable, with a high prevalence of underweight and stunting (5). Poor dietary diversity and low household food security along with suboptimal feeding practices in terms of delayed or non-exclusive breastfeeding is identified as key contributing factors to poor health outcomes (7,8).

Child health is closely linked to maternal health. Inadequate antenatal care and lack of awareness about nutrition during pregnancy further exacerbate poor outcomes, such as preterm birth and low birth weight babies (9).

Access to healthcare services in tea gardens is often limited. Long distances to facilities, lack of transport, and shortages of skilled professionals restrict timely maternal and child healthcare (10). In many cases, women deliver at home without skilled birth attendants, increasing the risk of neonatal and maternal complications or mortality (11).

Socioeconomic and cultural factors have also been found to play a significant role, with low levels of education and mistrust in healthcare systems affecting care seeking behaviours (8,12) . Financial and time poverty also reduce the resources to prioritise health (13)

The World Health Organisation (WHO) provides recommendations to monitor and improve childhood outcomes (14,15). Aligning local monitoring with WHO recommended policies can help identify gaps, guide targeted interventions, and track progress towards improved child health.

Although some research has been undertaken on health outcomes in tea gardens, there is still a lack of comprehensive research on child health, particularly in terms of socioeconomic and healthcare access. Given that children and women in these communities are a vulnerable population, perspectives from workers that are within

these communities are helpful to gain an understanding of the barriers and facilitators to improved health outcomes and develop effective implementations to address these.

Methodology

This qualitative research adopts a phenomenological approach, aiming to uncover and interpret the lived experiences of participants (16). Collection of data was conducted through six semi structured interviews with community health staff members from CINI, allowing participants to give personal accounts on own perspectives (13).

Thematic analysis, following Braun and Clarke's framework and supported by NVivo software, was used to identify and organise key themes in the data (17).

Results

Four overarching themes were obtained from analysis of data gathered, with subsequent subthemes identified as influencing child health outcomes in rural tea garden communities.

Nutrition and Feeding Practices:

Severe malnutrition and food insecurity were widespread. Mothers often struggled to provide adequate breastfeeding due to long working hours and lack of time. Interventions like kitchen gardens and Nutritional Rehabilitation Centre referrals were noted as considerable facilitators in improving nutrition and feeding behaviours.

Healthcare Access:

Distance to hospitals, poor transport and limited staff availability were reported to restrict access to care. Low literacy and cultural beliefs also impacted health-seeking behaviours. However, home visits and community ambulance services were effective in bridging gaps.

Structural Socioeconomic and Employment Constraints:

Poverty and long working days proved a hinderance on maternal caregiving. Most women lacked maternity leave and continued working through pregnancy. Creches provided some support but were not consistently available.

Advocacy and Community Collaboration:

Community engagement and advocacy were seen to be key in improving outcomes. CINI's efforts in health education, institutional connections and service delivery aligned with global standards mostly and seen to be effective throughout.

Discussion

This study was able to provide insight into the barriers and facilitators of improving child health outcomes in rural tea gardens. This study extends understanding by highlighting the unique nature of interlinked challenges and enablers of nutrition, healthcare access, socioeconomic constraints and advocacy efforts.

Poverty was seen as a significant barrier, restricting access to food and healthcare, while long maternal working hours reduced time for feeding and limiting engagement with health initiatives to improve health.

Malnutrition was a major concern, worsened by food insecurity and maternal time constraints due to labour demands. To respond to this, CINI's practices in nutrition and breastfeeding awareness programmes aligned with WHO recommendations on improved child health outcomes (18,19). However, barriers persisted in implementation of these due to differences in manager support and awareness amongst workers and their families.

To overcome this, information sharing and community collaboration between CINI and local health workers was seen to be an effective facilitator.

Recommendations

The barriers and facilitators to improving child health outcomes are intertwined and to address these disparities change needs to result on the individual and structural scale. Interventions should be focussed on building community voices, as well as increasing sustainable nutritional interventions such as community kitchen gardens and creche facilities to facilitate breastfeeding. Maternal working constraints impacting childcare should be addressed with better recognition in policy surrounding maternity provisions. This research aims to be shared with participants and CINI to help strengthen future practice.

Word Count: 983

Chapter 1- Introduction

1.1 Overview of Study

This research used qualitative methodology to explore the perceived barriers and facilitators in child health outcomes in rural tea gardens and examine the role of Child In Need India's initiatives against world health standards.

1.2 Background and Context

The health and survival of children are fundamental indicators of development and equity of a society (20). Despite global progress in reducing child mortality and improving health outcomes, many communities, especially low- and middle- income countries (LMICs), continue to experience high rates of malnutrition, inadequate healthcare access and preventable childhood illnesses (21). These health challenges are exacerbated in marginalised and rural communities, where factors such as poverty, poor infrastructure and geographical difficulties compromise the effectiveness of health interventions (22). One marginalised population is tea garden communities in India. This study explores the barriers and facilitators of child health outcomes in this neglected population, evaluating how community-based health interventions, in particular those led by Child In Need India (CINI), align with world best practices in healthcare.

Globally, the health of children has seen significant improvement in the past years (23). However, the level of under-5-mortality remains considerably high, with 4.8 million children dying in 2023, many from preventable conditions (24). Malnutrition remains an underlying influence in around 45% of children under-five deaths (21). International frameworks, such as the Sustainable Development Goals (SDGs),

recognise these challenges and disparities in healthcare improvement. SDG 3 calls for universal access to healthcare, reductions in child mortality and the end to malnutrition (25). Despite global efforts, inequities persist, especially in rural and socially disadvantaged populations.

Whilst India has made important advancements in child health improvement, the country continues to hold a disproportionate burden of global undernutrition and child mortality (1). According to the National Family Health Survey (NFHS-5), almost one third of children are underweight (1). This figure is replicated across studies and often worse in rural areas, where access to healthcare and nutrition remains limited (5). Tea garden communities in West Bengal and Assam are burdened with these challenges, as unique structural and living conditions directly affect child and maternal well-being.

1.3 Livelihoods and Health Challenges in Tea Garden Communities

Tea gardens are an important source of employment for millions in India, with the tea sector being one of the largest contributors to India's economy (2). Women play a significant role in this workforce, used for their delicate touch to pluck tea leaves (2).

Workers often face long hours, low wages and inadequate access to health services (2). Living and working conditions in tea gardens are tightly interwoven. Under supervision from management, tea garden workers are provided housing, water and basic facilities, all of which are frequently substandard (3) .These environmental factors, exacerbate already high rates of child malnutrition, preventable diseases and under 5 mortalities. Onsite health facilities subsequently lack the equipment and resources in these remote settings to provide a good standard of healthcare (3). As a

result, child health in these communities is shaped by individual but also community behaviour.

1.4 Child Health in India: A Challenge

India has employed national efforts like the Integrated Child Development Services (ICDS) to combat the child health crisis (26), however gaps remain in healthcare access across the country. Health demographics of children show blatant disparities across regions and socioeconomic divisions (6). Rural children, especially within tea gardens, are more likely to be underweight and face an increased vulnerability to preventable diseases (6). Addressing these inequities requires tailored interventions targeted specifically at these communities' needs.

1.5 Problem Statement

Various public and non-governmental initiatives have targeted child health in India; however, tea garden communities remain deprived of recognition in policy and research. Despite ongoing efforts by Non-Governmental Organisations (NGO)s, significant barriers persist including poverty, lack of health infrastructure and health education. There is insufficient qualitative research capturing the lived experiences of workers in these communities, who can provide unique and in-depth perspectives on both the challenges and enablers of child health.

Although this study focusses on child health outcomes, it recognises that child wellbeing is greatly impacted by maternal health. Maternal malnutrition, inadequate antenatal care and lack of support compromise children's growth and development (27). Due to their interconnection, child health within this research cannot be discussed in isolation from maternal health. Therefore, to fully assess the barriers

and facilitators of child health outcomes, maternal health is also investigated throughout. There is limited qualitative research exploring these interconnections, especially from the perspective of health workers, who are positioned to identify both the barriers and opportunities at individual and structural levels.

1.6 The Role of CINI

The Child In Need India (CINI) is a national NGO focusing on the health, nutrition, education and protection of vulnerable children and women (4). CINI adopts a community-based model rooted in participation and advocacy. In tea garden communities, CINI works to bridge the gaps in service integration by training workers, improving access to government facilities and giving voice to communities for their own health. CINI also recognises the impact of mothers on child health: “Healthy mothers give birth to healthy children, and healthy children grow into healthy adults” (4).

By analysing CINI’s role, this research seeks to understand its impact as an NGO in utilising services and community engagement in improving health outcomes of children in a disadvantaged setting.

1.7 Significance of Study

This study contributes to the limited body of research on an often overlooked and neglected marginalised population, in both academic and policy discussions. Through focussing on the voices of local health workers, this research provides insights grounded in lived experiences rather than external assumptions. The qualitative approach allows for a comprehensive understanding of how structural barriers, accessibility practices and local innovations shape child health outcomes.

Additionally, the study offers practical recommendations for NGOs and policy makers for sustainable health strategies. Understanding how CINI operates in these contexts can reveal models that could be replicable for improving child health outcomes in similar communities.

1.8 Research Aim

This dissertation aims to:

> To identify the barriers and facilitators to improving child health outcomes in rural tea gardens in North-East India, as perceived by community workers working with this vulnerable group.

Figure 1- Research Aim

1.9 Research Questions:

1. What are the barriers to improving child health outcomes in tea garden communities?
2. What facilitators exist that support child health outcomes?
3. How do CINI's interventions and practices in improving child health compare to global health standards?

Figure 2- Research Questions

1.10 Dissertation Structure

This dissertation follows a traditional layout: literature review that presents current literature informed by the research aims, methodological approach and justifications

for its use, the results from interviews carried out, followed by a discussion of these findings along with the strengths and weaknesses of the study and any recommendations that have arisen.

Chapter 2- Literature Review

This chapter will first outline the strategies used to gather relevant literature, then discusses the literature in relation to the research aims. Exploration into past and current literature was helpful to gain insight into the existing health demographics of tea garden communities.

2.1 Literature Search Strategy

Searches were performed on PubMed and the Library of Dundee databases. The study title was deconstructed, and key phrases were extracted to be used as search terms, as seen in Table 1. Synonymous phrases were identified, and Boolean operators were incorporated to ensure the search was refined to the scope of the research (28).

The search, using the Boolean operators (such as AND, OR and NOT) and search terms, generated 156 studies: 67 from PubMed and 89 from Dundee Library. Grey literature including WHO guidance and defining a child health outcome were also included. Due to limited relevant current literature, the search included articles from the past 25 years (i.e. from 2000 to 2025), to gain a perspective on the overall demographics and previous barriers and facilitators that may be addressed.

Further review of abstracts, removal of duplicates and full review of the papers yielded 22 articles. The review strategy is described in detail in Figure 3. After reviewing the papers, the use of Critical Appraisal Skills Programme (CASP) tool was utilised to critically analyse the papers (29).

Table 1- Literature Search Phrases

Key Phrase	Alternative
Opportunity	*("enabler") OR ("facilitator) OR ("access")*
Barrier	*("challenge") OR ("disparity") OR ("difficulty")*
Child	*("paediatric") OR ("neonate") OR ("baby") OR ("infant")*
Tea garden	*("tea plantation") OR ("tea estate")*
Health Outcome	*("mortality") OR ("growth") OR ("breastfeeding") OR ("nutrition")*

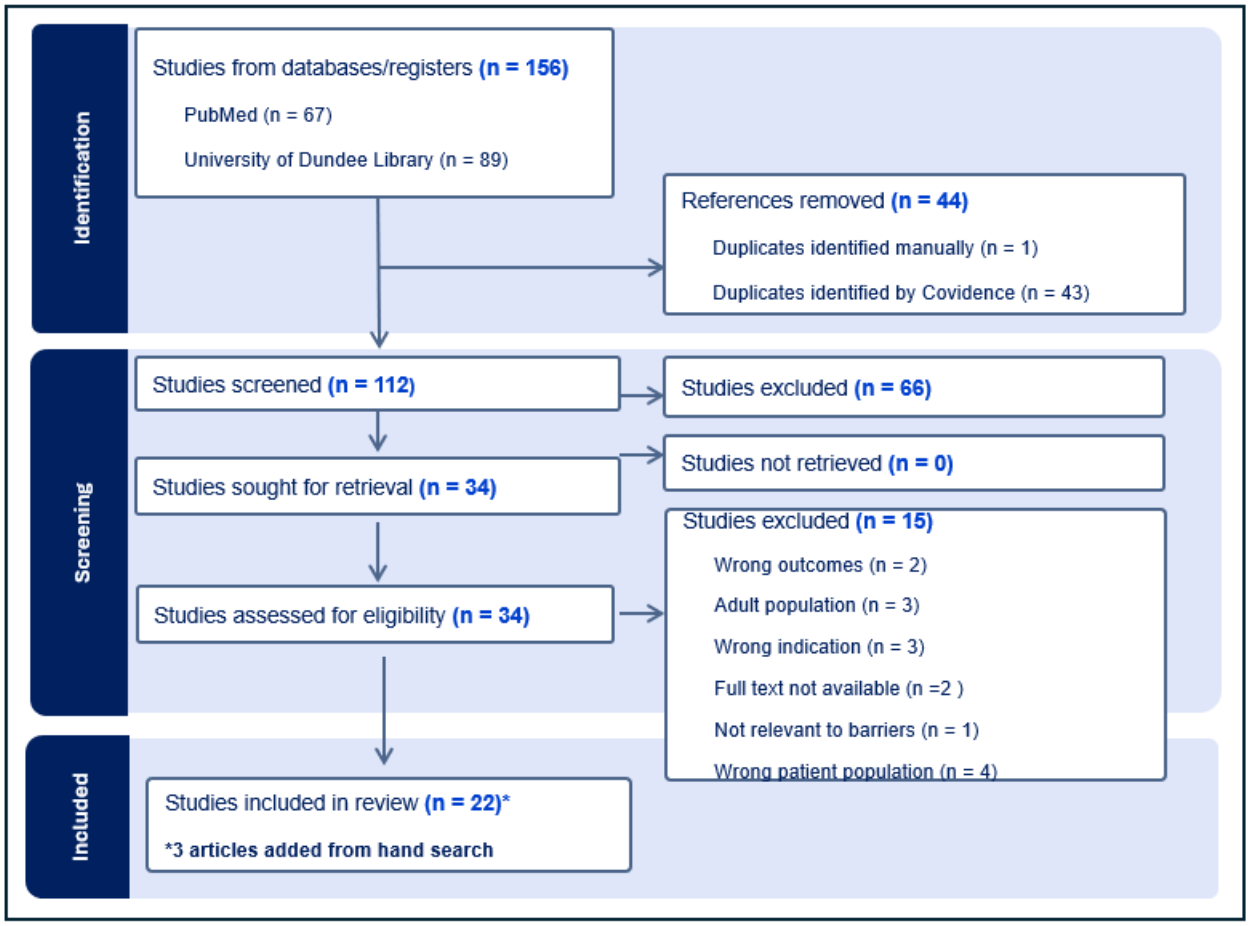

Figure 3- Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart

Through reading the literature, four comprehensive themes were identified. The following review is presented under each of these themes.

2.2 Theme One: Nutrition

Malnutrition is one of the most significant barriers to child health in tea garden communities. There are many studies reporting disconcertingly high rates of undernutrition and stunting amongst the child population within these tea gardens (5,7,30). Medhi et al. conducted a large cross-sectional study aiming to describe the health and nutritional status amongst a tea garden population in Assam (5). Through this study it was highlighted around 60% of children were underweight (5). Multiple factors contribute to malnutrition of the children, including busy parental occupation and children from mothers who are illiterate (5). Whilst the study presents valuable insight into the prevalence of malnutrition, its cross-sectional design reduces the ability to draw causal inferences. Due to this, it highlights that malnutrition is present at the time of the study, but not the individual barriers driving it.

Subtheme One: Food Insecurity and Malnutrition

Food insecurity has a tremendous impact on the nutritional intake of these communities. It has been assessed by Iqbal et al. within a tea garden in Bangladesh, around 85% of households were affected by food insecurity (7). This study provided a more longitudinal evaluation, where the prevalence of stunting was around 1/3 and 50% of children were reported underweight (7). This study provides a robust causality between food insecurity and child malnutrition.

Subtheme Two: Maternal Nutrition

Anaemia is a major health problem amongst women of childbearing age in India and a large proportion arises from insufficient iron and nutritional intake (31). Anaemia can lead to direct implications towards foetal growth and early childhood development (31). A community based cross sectional study derived that of 770 women, severe anaemia affected around 20%, with moderate anaemia affecting over 90% of the study population (31). This highlights the need for targeted interventions to reduce this health burden and to stop the cycle of poor nutrition and birth complications.

Subtheme Three: Challenges in Breastfeeding and Complementary Feeding Practices

Lack of structured child feeding practices, including sub-optimal breastfeeding and complementary feeding practices are a major factor in undernutrition and mortality within the first 2 years of a child's life (8). To distinguish the factors associated to inadequate feeding practices, Senarath et al. utilised data from the Sri Lanka Demographic and Health Survey, providing a comparison between children in the tea estate sector and surrounding urban areas (8). Growth deficit in children under 5 showed a higher rate (40.2%) in the tea sector, than in urban and rural combined (30%), with children living in tea sector having a lower dietary diversity than in other areas. Clear determinants in the lack of food diversity and adequate feeding practices were determined through this study including - lack of postnatal visits, low-income household and decreased maternal education (8). This study also determined that having a 'working mother' proved a significant factor in inadequate dietary diversity. Although the study was conducted in Sri Lanka, and therefore results may not be entirely generalisable, tea estates across the globe have similar

demographics and social determinants of health that can be compared between sectors. This study provides a gap in research as it did not investigate the specific socio-cultural influences on lack of adequate feeding practices in Tea Estates.

Furthermore, a study examining feeding practices in the first two years of life, highlighted poor nutrition (30). It identified a high prevalence of underweight children, concluding that the absence of exclusive breastfeeding, delayed onset of breastfeeding and unsuitable weaning diets, contributed to this significantly (30). This study concluded that education to mothers in the promotion of optimum feeding practices would be largely improve the nutritional status of these children.

Subtheme Four: Interventions to Improve Nutrition- The Role of Community

Communities serve as an invaluable source of support and encouragement in improving health outcomes (32). The Stimulate, Appreciate, Learn, Transfer (SALT) community-based approach, has demonstrated effectiveness in transforming health-related behaviours across various settings (32). In a clustered randomised control trial, Pramanik et al. evaluated the effectiveness of this strategy on improving immunisation coverage in Assam (32). The SALT approach empowers communities to take ownership of their health, fostering self-advocacy and localised action. While this study specifically examines immunisation, its findings offer valuable insights for designing nutrition interventions in tea garden communities. By addressing demand-side barriers, such as limited awareness and engagement, community involvement can drive sustainable improvements in service delivery.

Similarly, Paknawin-Mock et al. highlight the critical role of infrastructure and facilities in shaping child health outcomes (33). The study emphasises that day care services and community infrastructure significantly influence child growth and development

(33). These findings suggest that policy interventions within tea garden communities should leverage existing resources to optimise community participation. However, this study focusses primarily on community-level determinants, overlooking household factors that are known to influence child health. This presents a potential bias, as socioeconomic status, parental education and household nutrition also play a fundamental role in shaping child outcomes.

2.3 Theme Two: Maternal Health

Maternal health plays a pivotal role in determining child health outcomes; however, in tea garden communities, the multitude of maternal deaths impairs any progress towards improvement of child health (34) . Studies indicate that the significant causes of maternal mortality in these communities include haemorrhage, sepsis and pregnancy-induced hypertension (34). Rane et al. identified tea garden residency and poor antenatal care quality as determinants of maternal mortality in Assam (11). Additionally, the study highlights the importance of maternal health education and decentralisation of maternal-child healthcare services to improve accessibility and therefore uptake of quality healthcare (11). These findings align with data from the Sample Registration System (SRS- 2007-2009), a large demographic survey that provides annual estimates of the health in India. The report highlights that Assam has the highest maternal mortality rate in India, with tea gardens contributing disproportionately to these figures (31).

Subtheme One: Maternal Health Impact on Neonatal Outcomes

Unlike the broader implications of maternal nutrition on childhood growth, the effect of maternal anaemia, low Basal Metabolic Index (BMI) and inadequate weight gain during pregnancy predisposes women to give birth to low-birth-weight babies

(LBWB) and experience neonatal complications (13,35). Gogoi et al. highlighted the correlation between low pre-pregnancy weight and adverse birth outcomes (36). Through this cohort study it was demonstrated that almost 90% of mothers were underweight pre pregnancy, with approximately 2/3 babies being born underweight (36). This re-enforces the idea that to break the cycle of poor child health outcomes, maternal health interventions must also be a priority. To further this, Rasaily et al. assessed the risk factors of low-birth-weight newborns in a demographic cohort study from the Dibrugarh Health and Demographic Surveillance System (35). Their findings identified underweight mother, minimal income and poor maternal education as significant predictors of LBWB, highlighting the need for multi-sectoral interventions that address both health and socioeconomic determinants of maternal health.

Subtheme Two: Occupational Risks to Maternal Health

Tea plucking is a physically demanding occupation and pregnant women in tea gardens often lack access to maternity leave, with many working until their due date (13). This has direct consequences for maternal and neonatal health (13). Kumar et al. conducted a study on 175 women and found significant association between tea plucking during pregnancy and low birth weight outcomes (13). Their findings suggest that prolonged physical labour exacerbates foetal growth restrictions, especially in the absence of maternal rest and sufficient prenatal nutrition.

While the study provides valuable insights into occupational risks, it does not account for confounding factors such as pesticide exposure, gestational age or maternal stress levels, which may also contribute to poor neonatal outcomes. Future

research should explore workplace policies and interventions that support both economic stability and maternal health.

Subtheme Three: Strengthening Maternal Health Interventions

Government led maternal and child health programmes, aim to address challenges in healthcare by monitoring health trends and enhancing healthcare accessibility. One such initiative is the Dibrugarh Health and Demographic Surveillance, which developed a mobile application for real-time health monitoring, collecting sociodemographic and anthropometric data to facilitate evidence-based intervention strategies (6).This initiative proved successful in collaborating with local health workers and proved a useful platform for health data collection to back policy recommendations. However, it encountered difficulties in collaborating with tea garden authorities, such as the “chowkidars” (supervisors responsible for worker safety), who sometimes obstructed outreach efforts (6). These managerial barriers hinder the long-term impact of health interventions.

2.4 Theme Three: Healthcare Access and Infrastructure

This section explores healthcare access in rural garden communities, focussing on antenatal and postnatal care utilisation among women and children, as well as the existing infrastructure in these regions.

Subtheme One: Geographical Barrier to Healthcare Access

Access to maternal and child healthcare services in tea garden communities is severely hindered by geographic isolation, limited infrastructure and workforce shortages (37). A study on the Safe Motherhood Initiative in Sri Lankan tea gardens utilised Geographic Information Systems to map healthcare disparities, the

distribution of medical facilities and shortages of health care professionals (37). The study emphasises the urgent need for more equitable distribution of health care units and professionals. Although this research is limited to Sri Lanka, it poses a valuable resource for policy makers in different contexts, such as North-East India, where geospatial surveillance could be utilised to address healthcare access challenges more effectively.

Additionally, studies on maternal deaths in remote areas report high maternal mortality rates in Bangladesh's tea garden communities, where home births constituted to high maternal deaths (34). The study found that out of the maternal deaths on tea gardens, the majority were those who had home births (34). The research highlights delays in transportation and medical attention during maternal complications (34). The lack of healthcare structure and skilled birth attendants within these communities is impediment to address to mitigate these deaths.

Subtheme Two: Utilisation of Healthcare

Despite efforts to promote maternal and newborn health care, studies indicate that many women do not complete the recommended antenatal and postnatal care visits (10). Tripathi et al. assessed maternal healthcare utilisation in rural India defining complete use of essential maternal care as receiving at least four antenatal care visits, delivery by a skilled birth attendant, and postnatal care within 48hours (10). Recognised within the updates of the study is new guidance from WHO, that a minimum of eight antenatal care visits is now recommended (10). The study found multiple barriers – including cultural stigma, low education levels and financial constraints– significantly impact healthcare utilisation (10). In addition, mothers from a poorer background were around a third less likely to the use the recommended

care, indicating an urgent need for targeted interventions that address geographical and socioeconomic disparities.

While these studies effectively document the correlation between workforce shortages and poor maternal health outcomes, they often fail to propose concrete policy solutions. Furthermore, there is limited analysis of community-based programmes that actively address these healthcare barriers, highlighting a critical gap in the literature. There is also a lack of data specifically looking into child health care facilities within the remote tea gardens. Future research should explore the role of localised interventions to enhance maternal and neonatal healthcare access in tea garden communities.

2.5 Theme Four: Socioeconomic and Cultural Influences

The socioeconomic conditions and educational levels of tea garden communities significantly impact maternal and child health outcomes (9). A study on Adivasi mothers highlights the link between poverty, undernutrition and morbidity, emphasising that financial constraints severely limit access to essential healthcare services (9).

Subtheme One: Impact of Cultural Beliefs on Child Health

Cultural beliefs strongly influence maternal and child healthcare practices, particularly concerning breastfeeding and infant care. A study on infant mortality among tea garden workers in Assam identified several sociocultural factors, including increased number of births, adolescent motherhood due to early marriage and low maternal education levels, significantly increase the risk of infant mortality

(12). Additionally, cultural norms play a crucial role in shaping breastfeeding practices, directly affecting the nutritional status of children (30).

While these studies effectively highlight an understanding of cultural barriers, they do not explore how interventions could effectively address these ingrained beliefs. Future research must take time to understand these cultural influences so that traditional beliefs with evidence-based maternal and child healthcare practices can be integrated in future policy.

Subtheme Two: Impact of Education Levels on Child Health Outcomes

Maternal education is a key determinant of child health outcomes, yet many women in tea garden communities have limited access to formal education (8,10). Studies consistently demonstrate a strong correlation between increased maternal education and improved child feeding practices, greater awareness of maternal care and reduction in child mortality (8,10). However, while these studies acknowledge the importance of maternal education, factors such as gender discrimination, early marriage, and economic constraints remain largely overlooked.

Subtheme Three: Improvement in Educational and Economic Strategies

Investing in female education is a key strategy for improving maternal and child health outcomes. Research highlights that educated mothers are more likely to seek healthcare, maintain a nutritional diet, and adopt safe infant feeding practices (9,30). However, despite recognising the importance of education, many tea gardens lack the funding and opportunities to implement effective educational initiatives. It is important to bridge the educational gap and therefore improve health outcomes for future generations.

2.6 Current Recommendations on Child Health Outcomes

To assess improvements in child health outcomes, it must first be established what a healthy child is. Literature from Requejo et al. introduces a set of 20 indicators, developed by the Child Health Accountability Tracking group, for global child health and wellbeing monitoring (38). Under-five mortality, malnutrition and exclusive breastfeeding are particularly relevant key indicators to vulnerable populations, and cover major dimensions of chronic, acute and preventative healthcare.

The World Health Organisation (WHO) collaborates with partners globally to produce recommendations and approaches for child health agendas. Strategies such as the Integrated Management of Childhood Illness, in partnership with United Nations International Children's Emergency Fund (UNICEF) and Every Newborn Action Plan play roles in shaping child health policies globally (14,15). WHO guidelines are grounded in evidence-based practices, including exclusive breast-feeding promotion, immunisation coverage and maternal care access, which ensures its scientific credibility and global comparability. Due to its significant weight in shaping national and international health outcomes, it is an essential reference to be used when examining marginalised community's health.

2.7 Summary

The health of children in India's tea gardens remains a persistent problem. The literature highlights significant barriers faced by disadvantaged women and children in these communities, with malnutrition emerging as a key determinant of adverse childhood outcomes. Addressing this requires understanding the underlying causes - including poor maternal health, food insecurity, geographical disparities and socioeconomic constraints. It can be inferred from the literature that implementing

community-led initiatives that empower local populations in healthcare decision making may significantly improve nutrition and health.

Although studies were drawn from various tea-growing regions, the shared challenges across these populations suggest that interventions can be adapted using similar frameworks.

While not direct to children, maternal well-being is a significant factor in influencing the upbringing of a healthy child. High maternal mortality rates in rural tea gardens underscore the need for improved antenatal and postnatal support. Issues surrounding sufficient workforce and infrastructure further exacerbate maternal and neonatal health risks. Education also plays a fundamental role in empowering women to make informed decisions regarding nutrition, healthcare and child-upbringing.

This literature review highlights the multifactorial nature of barriers and facilitators influencing child health in tea gardens. However, there is limited research examining how these factors interact and reinforce one another.

This project aims to explore local perceptions of child health barriers and identify context-specific enablers in North-East Indian tea gardens. Additionally, wider dissemination of findings could inform policy and program developments, contributing to sustainable interventions to reduce child health disparities.

Chapter 3- Methodology

This qualitative research adopts a phenomenological approach. Data collection was conducted through semi-structured interviews with community facilitators working on tea gardens in West Bengal. Thematic analysis was used to develop codes and themes. Ethical considerations were considered throughout.

3.1 Theory of Research

This study adopts phenomenology as its research paradigm and methodology. Establishing a research paradigm ensures coherence between research questions, methods and data analysis, determining how findings are interpreted (39). First introduced by Thomas Kuhn, a paradigm reflects a shared set of assumptions within a community regarding ontology, epistemology and methodology (40). Defining the research paradigm enhances the significance and congruity of a study (39).

This research, grounded in the phenomenology, seeks to explore and interpret the lived experiences of women and children, as conceptualised by Edmund Husserl (41). Phenomenology centres how individuals perceive and comprehend their reality (41). According to Wojnar and Swanson, two main branches of phenomenology are relevant to holistic human care: descriptive and hermeneutic (16).

Descriptive phenomenology, described by Husserl, aims to reveal the essence of experiences through direct interaction with participants (41). A key concept is “bracketing”- setting aside personal biases to assess unfiltered experiences (41). In contrast, hermeneutic phenomenology, articulated by Heidegger, focusses on interpretation, viewing context as fundamental (42). It considers both the participants’

lived experiences and the researcher's interpretations (41). To understand individuals, their social context or culture should be considered (16).

Descriptive phenomenology assumes the researcher can set aside bias, but this is often critiqued as unrealistic, especially across cultures (16). Hermeneutic phenomenology, however, acknowledges the researcher's role in interpretation, allowing them to reflect on their cultural and social position (42).

While ethnography is a recognised approach to explore lived experiences within specific settings based on direct observation, it was not selected due to practical constraints (43). Ethnography requires prolonged immersion, which was not feasible given the time, geographical distance and ethical concerns. As an outsider, ethnographic fieldwork also posed challenges in rapport-building, overcoming language barriers, and ensuring cultural sensitivity.

Given the historical and social complexity of child health in tea gardens, descriptive phenomenology risked oversimplifying participants' experiences. Hermeneutic phenomenology, however, embraces subjectivity and reflexivity, aligning better with the research context and aim.

Ontology

Ontology refers to the study of being and what exists in an individual's reality (44) . It emphasises that knowledge arises from individual's own lived experiences (44). This study adopts a relativist ontological position, recognising that reality as subjective and shaped by individual experience and context (45). Each participants' account is views as a valid expression of their reality.

Epistemology

Epistemology is the study of knowledge and how it is constructed (44). This study uses an interpretivist epistemology, which values understanding subjective experience (45). In this study knowledge is viewed as co-constructed through interaction between researcher and participants.

3.2 Research Design and its Rationale

A qualitative design enabled an in-depth exploration of the barriers and facilitators affecting child healthcare in tea gardens. Data was collected through semi-structured interviews.

Research may follow quantitative, qualitative or mixed method approaches (46). Quantitative research uses numerical data to analyse variable relationships and generate statistically significant findings (46). Qualitative research, however, explores complex phenomena through non numerical data such as words and behaviours to understand meaning, experiences and social context (46). Given the aim to examine perceptions and experiences, qualitative research was appropriate for exploring how individuals' backgrounds and environments shape their views (47).

Semi-structured interviews were selected for flexibility and ability to capture personal perspectives (48). They allowed the interviewer to adapt questions based on participants' responses allowing for in-depth discussions (48).

Due to language differences, an interpreter was required to ensure accurate translation. Translation is crucial in qualitative research to portray the participants' meanings (49). The process of using translation should be documented to ensure transparency (49).

Although focus groups are a valuable qualitative tool that facilitate group dialogue, they were not suitable here (47). Coordinating schedules between participants and interpreter posed logistical challenges, and managing group dynamics, especially with interpreter involvement, would have complicated data collection.

Study setting

Participants were based in West Bengal, India. Data was collected in March of 2025. Due to geographical constraints all interviews were conducted online via Microsoft Teams and recorded and automatically transcribed. Interviews were scheduled in consideration of time zone differences.

Study Population

Participants were employees by CINI as community facilitators within tea garden communities. Community facilitators are support workers trained by CINI to deliver their programmes such as nutrition and breastfeeding awareness classes. They work in partnership with the government health workers to care for the population of the tea gardens, primarily the women and children. Their roles include conducting home visits, promoting health initiatives and monitoring maternal and child health.

Five participants worked across multiple tea gardens, while one was responsible for a ‘high-risk’ closed garden, where tea production had ceased, and residents sought external employment.

Table 2- Participant Roles and Tea Gardens Overseen

Participant Number	Job Role	Tea Gardens Overseen	Combined population of Tea Gardens
1	Community Facilitator	20	167,102
2	Community Facilitator	5	37,392
3	Community Facilitator	4	36,532
4	Community Facilitator	4	34,219
5	Community Facilitator	5	30,171
6*	Community Facilitator	1	6034

**Participant 6 oversaw the 'high-risk' closed tea garden.*

Preferably, interviews would have been conducted directly with the women and children. However, involving these populations would have deemed this project as high risk ethically. Most importantly, tea garden workers' income is dependent on daily yield, therefore participation in interviews could have compromised their earnings. Thus, community facilitators were selected as participants, as they were able to offer informed perspectives closely tied to the lived realities of the population.

Sample Size

Unlike quantitative research, qualitative research prioritise depth over breadth. The richness of insights is considered more valuable than large numbers (46). Data saturation is used to determine adequacy of sample size, occurring when no new themes emerge (50). In this study, saturation was reached in interview five, with the sixth conducted to ensure confirmability of themes.

Recruitment

A purposive sampling strategy was used, selecting participants based on their relevance to the research aim (47). This ensures that focus on the phenomena is explored through information-rich cases (51).

CINI facilitated recruitment by distributing participant information sheets (appendix 1) and consent forms (appendix 2). Participants were fully informed of the study aims and reminded they could withdraw at any point, or up to 14 days after the interview.

An interpreter, also provided by CINI, supported all interviews. Scheduling was coordinated via email.

Interview Protocol

An interview guide (appendix 3) was developed, constructed from the key themes identified in the literature review. Systematically constructing an interview guide strengthens trustworthiness and reliability trustworthiness and reliability of data gathered (52). The guide consisted of open- ended questions aimed at eliciting participants' views on healthcare access, systemic challenges and child health.

Data Management

Interviews were recorded via Microsoft Teams and transcribed using the platform's built-in tool. Transcripts were manually reviews to ensure accuracy, particularly due to language and accent variations. Recordings were deleted post-transcription.

The anonymised transcripts were securely stored on the University of Dundee's OneDrive, accessible by only the researcher, to ensure maintain confidentiality.

Data Analysis

Data analysis followed Braun & Clarke's six-phase thematic analysis framework (17). The process involves repeated engagement with transcripts to identify meaningful patterns, offering a systematic yet adaptable process suited to qualitative research. This method aligned with the hermeneutic phenomenological approach, supporting interpretation within a cultural and social context (17).

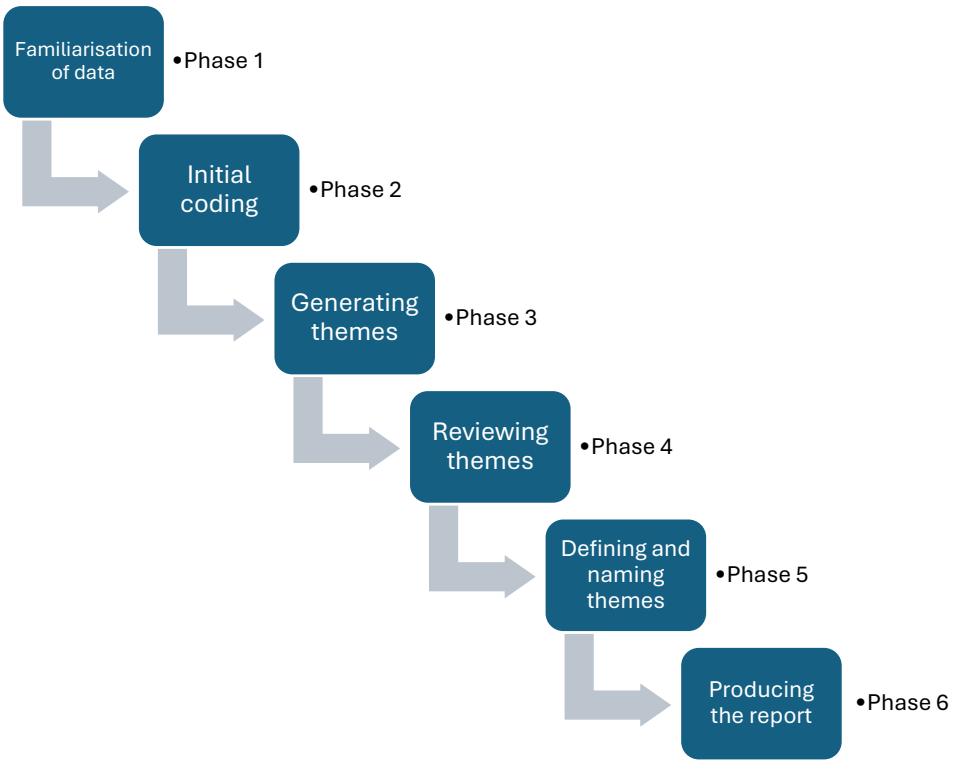

Figure 4- Outline of Braun and Clarke's six-step thematic analysis

Codes were identified using a mixture of line-by-line coding and thematic memos. NVivo software was utilised to support data management and code organisation, facilitating deeper engagement with findings. Reflexivity was maintained throughout analysis to acknowledge the researcher's positionality and potential bias.

The approach of analysis ensured that results remained contextually relevant and rooted within participants' experiences, aligning with the study's hermeneutic phenomenological paradigm.

3.3 Ethical Considerations

Ethical approval was obtained from the University of Dundee and CINI's internal ethics committee (appendix 4 and 5).

Obtaining informed voluntary consent ensured participants fully understood the research process (53). Given the language barriers, adaptations to obtaining informed consent were implemented. The study was explained verbally via interpreter, with participant information and consent forms translated and read aloud. It was emphasised that the participation was entirely voluntary, and individuals could withdraw at any stage of the interview. Written and verbal consent was obtained prior to interviews.

Confidentiality was paramount to ensure participant privacy and data security. Pseudonyms were used and any identifiable information was removed.

Conducting research as an outside in rural Indian context raised concerns around cultural sensitivity and positionality (54) . To ensure respectful engagement, rapport was established with CINI, who provided guidance on appropriate research practice and interview questions.

Throughout the project, the researcher remained reflexive and acknowledged throughout how positionality could shape interpretation (54).

3.4 Summary

This study adopted a qualitative design underpinned by hermeneutic phenomenological paradigm to explore lived experiences surrounding child health in rural tea gardens. Semi-structured interviews with six CINI community facilitators enabled collection of narrative data. Thematic analysis, supported by NVivo software, allowed for reflexive interpretation of participants' accounts. The chosen methodology ensured alignment with research aims, data collection and analysis, whilst also recognising the researcher's positionality throughout.

Chapter 4- Results

This chapter outlines the results of the research as four themes, each with subsequent subthemes. These were identified from thematic analysis of the six interviews with CINI community facilitators working in the tea gardens.

Initially, themes were divided as barriers, facilitators and comparisons to WHO child health standards. However, after reflection, it became evident that overlaps of themes allowed for a more in-depth discussion. Each theme is presented with context and supported by direct quotations.

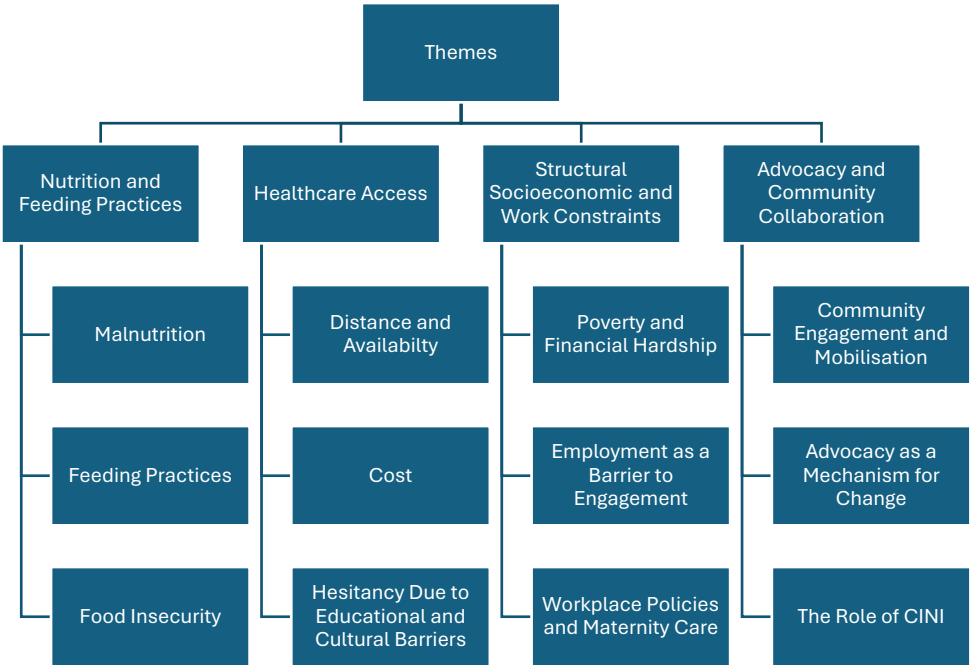

Figure 5- Overview of themes and subthemes identified from results of the semi-structured interviews.

4.1 Theme One: Nutrition and Feeding practices

Nutritional practices are crucial in shaping child health outcomes, with malnutrition, food insecurity and feeding practices being significant factors impacting early

development. Participants discussed the substantial barriers mothers face in providing adequate nutrition for their children. This theme is explored through three key-sub themes.

Subtheme One: Malnutrition

All six participants identified malnutrition as one of the most pressing health conditions faced by children on the tea gardens, with several noting this is a problem mothers are impacted by too. Each participants' role included some aspect of addressing nutrition within the tea garden communities, with many serving as 'nutrition programme coordinators'.

One participant described their role and what they deemed to be a crucial area of their work:

"The most important area is that I have been working with the malnourished children as we have identified 12 SAM (severely acutely malnourished) children in one area." (participant 1)

Participants consistently highlighted the identification of Severely Acutely Malnourished (SAM) children as a critical part of their work. Another participant described the use of home visits to monitor children's nutritional status:

"We have identified that there is a lot of severely acute malnourished children, this has been identified by carrying out home visits." (participant 1)

Several participants emphasised the need for nutritional awareness programmes and rehabilitation centres. The success of the Nutritional Rehabilitation Centre (NRC), which provides vital care to SAM children, was frequently mentioned, with the success of it in helping to combat the malnutrition of children highlighted:

"One year ago we identified 57 underweight children, then after monthly counselling with the families and sending them to NRC, 39 have recovered from being underweight." (participant 3)

This sentiment was echoed by another facilitator who stressed the importance of counselling parents:

"After regular counselling, sensitisation programmes and making the parents aware of the importance of NRC, the ration of malnourished children has decreased." (participant 2)

Subtheme Two: Feeding Practices

Discussed by all participants was the various social, economic, and occupational factors affecting timely breastfeeding and dietary practices in the tea gardens.

Regarding breastfeeding prevalence, participants reported an overall increase in adherence to recommended breastfeeding practices, following implementation of programmes that align with global health guidelines for exclusive breastfeeding for the first six months. As one participant noted:

"Breastfeeding is a common practice amongst the mothers because in programme sessions they (CINI workers) have been emphasising the importance of breastfeeding". (participant 3)

Exclusive breastfeeding was mentioned by four of the six participants, who stated that the situation has improved after the implementation of breastfeeding awareness programmes. Despite this, several barriers to breastfeeding were highlighted, particularly maternal employment. One participant explained:

"Six months after the child is born, breastfeeding is not done in time because the mothers go for work" (participant 1)

Another participant reinforced this barrier:

"If the children are breastfed then they can only have it in the morning, before their mother leaves and then only after she comes back. So, most of the children are malnourished in this area" (participant 6)

Most participants reported the introduction of solid foods at six months, in accordance with WHO recommendations. Increased awareness, nutrition programmes and counselling sessions have contributed to improved complementary feeding practices. However, despite timely initiation, diversity and nutritional value of foods varied. A recurring theme in participants' responses was the reliance on rice and cereal-based diets, with limits on inclusion of micronutrient-dense foods. One participant described the typical diet of infants:

"After six months, they are given a dish that is made with rice and lentils, very thinly cooked together". (participant 4)

Subtheme Three: Food Insecurity

Food insecurity emerged as a significant concern, with several participants reporting that many families struggle to afford diverse and nutritious meals for their children. Low wages and the cost of staple foods were frequently referred to as barriers to maintaining food security. One participant described the direct impact between income and the ability for mothers to provide nutritious foods:

"The income, it plays a very important role. The income is very low, so they are not able to provide the children or themselves nutritional foods" (participant 2)

Additionally, some participants also highlighted that large family sizes, which many do have, exacerbates food insecurity, making it difficult for all children to receive adequate diets:

"In many families there are many siblings, so at that time it is difficult to give them all the proper diet and food" (participant 1)

Beyond financial constraints, the availability and physical accessibility of nutritious food were identified as significant challenges, with fresh produce and protein-rich foods often located at significant distances from tea garden communities. One participant explained that taking time off work to travel for food was not a viable option due to lost wages.

To facilitate in addressing the barrier of inaccessible food due to poverty and distance, a 'community kitchen garden' has been introduced, where families can grow their own fruit and vegetables. One participant commented on the positive impact this has had on nutrition:

"The kitchen garden is very cost friendly, also they don't have to go to the market to buy expensive vegetables, they can eat fresh" (participant 5)

4.2 Theme Two: Healthcare Access

Multiple factors influence how members of tea garden communities access health care services. Discussions with participants explored consistent themes of physical, financial and systemic barriers.

Subtheme One: Distance and Availability

All participants highlighted the compulsory long distances required to reach essential healthcare facilities. Remoteness was a recurring issue, especially it's hinderance on health care of children.

"***The roads are very very bad, and transportation is very limited in the tea gardens, and the hospitals are very far" (participant 5)***

Most participants stressed the need for vehicles to transport sick children to the hospitals. The lack of transport was repeatedly identified as a major barrier.

"The need for a vehicle is important. The Tea Garden management provides the ambulance to children under one year but not to older children. So, whenever a child gets sick, they have to travel 40-45 kilometres". (participant 1)

"When they lack vehicles, it becomes very difficult to take children on time." (participant 3)

Participants also discussed maternity care, particularly the accessibility of services during labour. All six participants mentioned the vital need for transportation to hospital. One participant noted a correlation between the introduction of a community ambulance and an increase in institutional deliveries compared to home births.

"Initially there used to be a lot of home deliveries, but now the women are preferring to have institutional births because they are provided with a vehicle so it's easy for them to go to hospitals for delivery" (participant 5)

There was reported by participants to be inconsistency in presence of healthcare professionals. In one tea garden, with a population of around 8,500 there was one government doctor, a gynaecologist, who ***"comes every so often"*** **(participant 4).**

Participants saw the number of antenatal checkups as satisfactory. Although check-ups are free for pregnant women, their frequency is limited at 4.

"The mother gets one check-up at 3, 5, 7 and 9 months. So, there is 4 in total" (participant 4)

However, pregnant mothers are routinely provided with iron and calcium tablets. Many participants also described increased monitoring of 'high risk' mothers including those with high blood pressure, poor nutrition or who are under 18.

A recurring and encouraging theme identified across multiple interviews was the use of home visits to facilitate maternal and child healthcare access. These home visits were widely regarded by participants as effective for engagement and monitoring.

"I go around on home visits every day and identify high risk mothers. These are very important because they are interactive with the mothers and I can tell them 'these things are good for you', 'you have to take this food', 'you should attend this appointment'. (participant 6)

However, due to limitations in resources and health professional availability, there were differences across participants in relation to the utilisation of these visits, with some carrying them out more than others.

Subtheme Two: Cost

Closely linked to availability, affordability was a recurring concern. There were disparities highlighted in what is financially available for women and children in tea garden communities. One participant highlighted although they can decide where to choose to receive care, financial limitations often restrict them.

“***If it’s anything serious, they have to go to the private (hospital). But normally tea garden people cannot afford to go” (participant 4)***

Participants also noted disparities in infrastructure across different tea gardens. It was apparent that some Tea Gardens have better facilities. It was emphasised by participants the importance for healthcare facilities within the communities for facilitating programme delivery and health monitoring.

“Some Aganwadi infrastructures- the government health centres that are run for children regarding nutrition and where they counsel mothers about health issues- are good but some Aganwadi infrastructures are not good at all” (participant 1)

“If the infrastructure is not good, we have to carry programmes out in a corridor or outside” (participant 3)

Subtheme Three: Hesitancy Due to Educational and Cultural Barriers

Hesitancy among mothers in accessing healthcare for themselves and their children was a common theme. Three participants linked this reluctance to educational and cultural barriers. An important insight emerged from one participant’s reflection on how a mother’s lack of education negatively impacted her child’s wellbeing.

“Because the mother was not educated, they are not aware how to look after their children properly, or understand what good nutrition and care involves” (participant 2)

This was not an isolated occurrence, with other participants echoing the same experiences. This highlights a significant difficulty faced when engaging mothers in health promotion initiatives.

"The women are not educated, so they do not grasp what we are saying to them and what we are telling them are good/bad health practices." (participant 3)

Although lack of maternal education was suggested as a barrier, the lack of surrounding family education – particularly that of the fathers- was discussed as a more prominent deterrent of engagement. Three participants considered the illiteracy and education of the fathers to be an obstacle in engaging mothers. Another participant discussed the pressures and lack of support given by partners.

"The husbands think the household activities won't get done if their wives spend time in the training or programmes, so that way they are not supporting the mothers." (participant 1)

Participants also described family influences as a challenge in sustaining mothers' participation in programmes. Although most women initially agree with what is being taught, family opinions often reversed that engagement. One participant discussed that helping the whole family understand was the toughest part, but most important.

Additionally, there were cultural influences that impacted health seeking behaviours. Acceptance of 'common health practices' – as recommended by WHO, were met frequently with uncertainty. It was stated that difficulties arise especially regarding vaccinations and hygiene. The deep-rooted nature of this barrier within the community poses a crucial barrier to healthcare access.

"Because tea gardens are diverse communities with lots of religions and castes, everyone has their own beliefs. So, when we do counselling sessions they hesitate to understand or accept what we are telling them". (participant 3)

One participant discussed the emotional labour and time taken to navigate cultural resistance:

"It becomes very difficult as we don't want to go against anyone's beliefs. We have to keep going back to same mother to make her understand what is important". (participant 4)

4.3 Theme Three: Structural Socioeconomic and Employment Constraints

This theme explores how financial hardship, employment conditions and workplace policies affect child health outcomes. Participants' responses consistently pointed to structural barriers that limit mothers working in tea gardens from engaging in programme initiatives and meaningful caregiving practices. Discussions highlighted how persistent poverty, coupled with inflexible work environments, places burden on mothers' capacity to prioritise and respond to health needs of their children. Subthemes discussed below emerged from this topic.

Subtheme One: Poverty and Financial Hardship

Participants frequently reported how chronic financial hardship of families impacts their ability to meet basic health needs of their children. In multiple cases, poverty undermined themes already mentioned such as inadequate nutrition and limited healthcare access- impacting overall child health. The lived experiences of the women were disclosed by participants, where insights into the extent of deprivation was apparent.

“They (women tea workers) lack money. The daily earning is ₹240 (£2.20) only after plucking 25 kg of tea leaves. So that equates to not a lot of money.” (participant 1)

Deprivation was a dominant theme throughout, with all six participants reporting its negative effect on childcare. Three participants highlighted the direct impact low income has on food poverty and equating to the malnutrition of children.

One participant explicitly highlighted the income disparity between tea garden workers and those living outside the community, correlating poverty within the garden to reduced quality of life.

“***There is a difference between the people who are in the tea garden and outside. This is because the income (inside the garden) is very low compared to people who are outside the tea garden”***

Subtheme Two: Employment as Barrier to Engagement

Analysis revealed a strong theme around the conflict between work obligations and caregiving responsibilities. All participants consistently spoke about the challenges posed by long, inflexible workdays, which force the prioritisation of labour work over supporting child health and development.

“The main issue is that mothers are working for eight hours, so in the mornings they are in a rush, and in that way, they are not able to look after the children’s food, diet and hygiene”. (participant 3)

Four participants also discussed how work constraints affect breastfeeding in the first six months after birth. It was thought this leads to inadequate nutrition of children.

While knowledge of breastfeeding practices aligned with WHO guidelines, participants emphasised that work constraints prevented proper implementation.

"Six months after the child is born, the breastfeeding is not done in time because the mothers go for work. We know that children shouldn't be given anything other than mother's milk but it's difficult because they are not able to provide breastfeeding on time" (participant 1)

Supporting mothers to breastfeed around work constraints was highlighted by the community facilitators as an important role in their jobs. Four participants recognised the positive impact garden creches have had on facilitating breastfeeding. Women were able to take very short breaks from work to feed their child if they were nearby in the creche. It was understood that mothers needed to work, however children also need to be fed adequately. It was clear that a main aspect of the community facilitators' role was to help provide a bridge between work and childcare.

"In the tea garden there has been a creche made that is near where the mothers work. That way they can carry on work, and breastfeed when the child is crying" (participant 4)

However, despite the positive impact, such facilities were not available across all tea gardens, with disappointment being shared by participants regarding this. This highlighted a clear area for improvement.

The theme of neglect, discussed sensitively, was raised by two participants. While they acknowledged women must work to provide income for their families, the participants described how this often equates to self-neglect and compromised child health.

"When they are pregnant, they are working a lot, and they are not concerned about their own health. So that way they are neglecting their health and the child's" (participant 1)

A common thread of discussion was the inability to engage mothers in initiatives, with all six participants highlighting the strenuous workdays as a significant barrier to implementing health programmes. Most participants discussed the difficulties in working around the mothers' working days, whilst also trying to fit in time for meaningful health interventions.

"Gathering the community mothers together is one of the most difficult tasks we face. The numbers of participants are low in programmes because they work" (participant 3)

"We work around the women's schedules, and plan meetings around their workdays. We even try meet when they are weighing up the tea at the end of the day. That way they're all together in the same space at the same time" (participant 5)

The workload extended beyond the tea plucking. Participants highlighted that women also carry the burden of household responsibilities, such as cleaning and cooking, further limiting their ability to engage in health initiatives.

Subtheme Three: Workplace Policies and Maternity Care

This subtheme reflects the ways in which tea garden policies- or absence of- shape maternal and child health experiences. The analysis highlighted significant gaps in maternity leave provisions, breastfeeding support and workplace accommodations

for pregnant women. Participant experiences varied, but a common theme was the lack of structural support.

One of the most prominent issues that emerged from discussions surrounding maternity care was the lack of maternity leave. It was evident that pregnancy presented challenges surrounding insufficient income, describing a tension between earning and protecting maternal and child health.

"Sometimes what happens is that the pregnant mother is not fine, but they have to work until 6-7 months, sometimes 8, because they have to earn and can't just stay at home. These mothers become very high-risk pregnancies" (participant 5)

While some participants emphasised the lack of pre-birth maternity leave, others focussed on insufficient postnatal support. A common theme amongst all participants was the concern over inadequate financial support provided by managers, leaving families in difficult situations.

One participant, from a tea garden that had been closed for 26 years, provided a distinct example when women in that tea garden must travel to other gardens for work. During pregnancy, they are often deemed too high risk to travel, leaving them unemployed and without income.

"During pregnancy they do not go to work, and only after the child is one year they are allowed back. But during that time the tea garden do not support them with any wages." (participant 6)

This situation was described as hostile, with participants highlighting the psychological and physical toll on mothers during this period of pregnancy and unemployment.

The absence of maternity leave policies, with many women returning to work sooner than recommended, was a major concern for safety and childcare of the newborn. Participants agreed that improving maternity leave policies could lead to better health outcomes for both mothers and infants.

4.4 Theme Four: Advocacy and Community Collaboration

This theme explores how advocacy, peer led initiatives, and organisational partnerships collectively work to improve maternal and child health outcomes within tea garden communities. Through analysis, a strong pattern emerged around the strength of community driven action and support in addressing health barriers. Participants had shared experiences of empowering women and children about health, facilitated through collaborative efforts between local actors and CINI. This theme is organised into three interconnect subthemes.

Subtheme One: Community Engagement and Mobilisation

Participants' accounts reflected how locally initiated programmes have contributed to improved health awareness and behaviours related to maternal and child health. Analysis revealed that community networks were seen as instrumental in providing health information and encouraging positive practices such as breastfeeding, balanced nutrition and hygiene. Beyond individual behavioural change, the data also suggests that such initiatives contributed to broader shifts in health norms within the community.

"There is a remarkable change within intervention areas. Malnourished children have been treated properly with the help of collaboration with NRC

(nutritional rehabilitation centre). So that has brought a change in the community." (participant 2)

Collaboration emerged as a key factor in interventions. Participants viewed the importance of including local health workers as a factor to programme success and sustainability. On top of this, the use of continuous home visits was seen as a facilitator to engage mothers in the community.

"***The ANMs, ASHA workers, the government representative and us (CINI community facilitators) work closely, and go door to door to give information on programmes." (participant 1)***

Discussions emerged regarding engagement of tea garden community management. There was a divide in participant views regarding how likely managers were seen as a barrier to programme initiatives. While two participants stated that managers on tea gardens were open to health efforts, others recalled difficulties in gaining cooperation. Management support was perceived as either a significant barrier or facilitator to programme success.

"The challenges faced (in programme initiation) are that when management is supportive, they (women and children) get facilities, whereas when the management is not supportive, the workers don't get any support" (participant 2)

Subtheme Two- Advocacy as a Mechanism for Change

Advocacy emerged as a pervasive and central theme across all interviews. Participants consistently described advocacy as essential to driving health related

change. This included advocating for access to healthcare services, implementing policy improvements and voicing the needs for women and children.

Notably, the success of interventions was often linked to their ability to strengthen local advocacy capacities.

"The first step of initiatives in the Tea Garden is gaining support from management. We do this through advocating to them. If we get the support, we can easily work with the tea garden people" (participant 1)

Advocacy was also perceived to be fundamental in relaying information to family members, especially to gain their support for child health promotion. Five participants highlighted how advocacy helped spread information and encourage engagement in better health practices. One participant described how advocacy in the community helped increase awareness and referrals to the NRC:

"Grandparents were reluctant to send child away to NRC but once they saw the recovery of their grandchild, they also starting advocating to other pregnant mothers the importance of NRC. Since then, two more children went to NRC". (participant 4)

Closely linked to advocacy were 'sensitisation' programmes. Sensitisation programmes were frequently described as the key for introducing new health related topics such as nutrition, hygiene and breastfeeding. These programmes were seen as critical to gaining cooperation between mothers and management.

It was apparent that advocacy played a major role in community facilitators workload. Four participants used the term 'advocacy' when as part of their job description. All participants highlighted advocacy's role in policy initiation, especially surrounding gaining the ambulance service.

"We have done a huge amount of advocacy with the government authorities to provide the vehicle for the NRC, which has had a great impact." (participant 2)

It was identified by multiple participants that advocacy was not just imposed on the community but a means to help empower and educate mothers in health practices regarding themselves and their children.

Subtheme Three: The role of CINI

Focussing on participants' perspectives regarding the contributions of Child in Need India in promoting maternal and child health within the tea garden context. Through analysis, programmes implemented by CINI were consistently identified as a key facilitator in the access, education and support of child health care. Participants described CINI as not just a service for change to address inequalities.

CINIs work aligned with WHO practices, particularly in monitoring child growth and nutritional status. All six participants referred to the success of CINI-led initiatives, including introduction of growth charts *(appendix 6)* and visual guides *(appendix 7)* that improved health literacy among mothers.

Celebration schemes – such as Breastfeeding week and Nutrition month, were discussed as major contributors to engaging mothers with healthcare initiatives. These events fostered excitement and collective learning.

"The most successful programme has been the breastfeeding week and nutrition month. During this period, new and old mothers turn up. There is a huge number of women coming to these" (participant 6)

"Women enthusiastically participate in Breastfeeding week and nutrition month. And they also like International Women's Day" (participant 4)

Despite the widespread impact of CINI's initiatives, participants pointed to limitations in resources and areas of improvement. Some participants disclosed contrast in conditions between CINI-supported gardens and those without, noting significant differences in health outcomes.

"Where CINI is working, because of the sensitisation, networking and advocacy, there is differences. Where CINI is not working, you will definitely meet more malnourished children and high-risk mothers." (participant 5)

Three participants vocalised the frustrations and sense of helplessness over these disparities. These reflections recognised the finite resources and capacity of NGOs.

Nevertheless, CINIs approach was effective and appreciated, consistently associated with positive community health changes, and particularly bridging the gap between all stakeholders involved in tea gardens.

"There are gaps in resources but whenever CINI is working, we work as a bridge between those gaps, as well as a bridge between the government and community" (participant 6)

4.5 Summary of Results

Multiple barriers and facilitators for improving child health outcomes in rural tea gardens in India were identified through analysis of results, as outlined in Table 3.

Table 3- Outline of barriers and facilitators under each theme identified

Theme	Barriers	Facilitators
Nutrition and Feeding Practices	High prevalence of child malnutrition	NRC referrals
	Food Insecurity and Poor dietary diversity	Nutrition awareness sessions and Breastfeeding promotion events

	Early cessation of breastfeeding due to work	Community Kitchen gardens
Healthcare Access	Long distance to hospitals and lack of transport	Home visits and community ambulance services
	Few doctors and healthcare staff	Cross sector collaboration- CINI and ASHA/ANM/CHO workers
	Low maternal and family education	Garden creches – (in some gardens)
	Cultural and religious hesitancy	
Socioeconomic and Workplace Constraints	No structured maternity leave	Flexible health programme scheduling
	Long inflexible work hours	Community facilitator advocacy- to bridge work-care gap
	Limited time for health programme participation and caregiving practices	
Advocacy and Community Collaboration	Mixed support from tea garden management	Strong advocacy from CINI
	Limited reach of CINI in non-targeted gardens	Community sensitive and peer-led promotions
		Collaboration with garden management

The results of the semi-structured interviews provide insight into lived experiences of tea gardens. The barrier to improving children's health in these populations was discovered in interrelated themes that emerged from in depth discussions. Malnutrition was highly prevalent among the child population, with poverty, working constraints and education playing a significant role in producing this health outcome. Breastfeeding practices were seen to be improved after implementation of community initiatives. There are still perceived barriers to this, with work constraints being a hindrance to caregiving capabilities as well as a barrier to engagement with health initiatives. Advocacy functioned as an encompassing theme, with the use of it

bringing about significant change in health behaviours in the communities. The findings of this study are compared with existing literature in the next chapter.

Chapter 5- Discussion

This qualitative research study aimed to explore the barriers and facilitators to improving child health outcomes in rural tea gardens in India, as perceived by CINI employees that work with this disadvantaged population.

Themes that emerged from the data are discussed in relation to existing literature. In addition, a discussion of current best practices is weaved throughout the analysis, and a comparison of these against the results is carried out. The strengths and limitations of this study are also explored.

5.1 Findings

Theme One: Nutrition and Feeding Practices

Nutrition in tea gardens is shaped by interlinked barriers and facilitators in income and resources, with malnutrition being a significant poor child health outcome. CINI's targeted initiatives have shown strong alignment with WHO recommendations, especially regarding the identification and treatment of severely acutely malnourished (SAM) children (18,19). However, disparities in resources and support remain significant barriers to address.

This study was able to provide insights into the significant prevalence of malnutrition amongst children in tea gardens. All participants identified malnutrition, especially severe acute malnutrition, as a critical health concern for children. The utilisation of home visits in monitoring growth of children was seen as a significant facilitator in aiding reduction of malnutrition. There was particular emphasis on the Nutritional Rehabilitation Centre (NRC) and its positive role in successfully treating and combatting SAM children. One participant noted an improvement of child malnutrition

from 57 children down to 18 children through the identification of SAM children by home visits, then subsequent treatment at NRC.

These findings of high rates of malnutrition corroborate current literature, where the incidence of malnutrition in tea gardens in Assam is around 60% (5). Additionally, Kirolos et al. highlights that severe childhood malnutrition can result in neurodevelopmental delays and growth deficits, emphasising the urgency of these findings needing to be addressed (55).

The CINI approach, of utilising home visits, growth monitoring and visual health tools, strongly lines with WHO-recommended community-based strategies for recognising and treating SAM children (18) . WHO states that early identification of severe acute malnutrition is vital to reduce the outcome of serious complications (18), an area in which CINI appear to be performing well in, reducing malnutrition from 57 children to 18.

Consistent with literature, while breastfeeding was reported as a common and encouraged practice, exclusive and timely breastfeeding often faced considerable challenges in the form of maternal employment (5,8). Participants explained that some mothers were only able to breastfeed before and after work, leaving a considerable period during the day where infants are not being fed adequately. Further research explores the adverse effect of delayed initiation of breastfeeding on the nutritional status of infants (30).

Although inadequate timing of breastfeeding was reported by participants, the importance of timely initiation and exclusivity of breastmilk was understood by women in the tea gardens. This study provides a deeper contextual understanding of factors/reasons behind why feeding practices are not always carried out to ‘gold

standard'. Local knowledge gathered adds to the understanding that feeding practices in tea gardens are impacted not by lack of knowledge but by lack of time and opportunity.

The positive impact of awareness programmes is evident. One study highlighted inadequate breastfeeding practices among a garden community, recognising there is need for improvement in maternal education surrounding the subject (10). CINI has employed methods to address this education gap. Participants noted that nutrition awareness programmes and visual aids provided mothers with self-sufficiency, tailored at supporting the nutrition of their child. These resources could be a potential implementation across tea gardens, to increase awareness but also sustainability of better nutrition practices.

WHO guidelines strongly advocate for exclusive breastfeeding in the first six months, with complementary feeding after this period (19). Participants recognised the implementation of creches near working sites as a significant enabler to better align with recommended breastfeeding practices. Despite this, inconsistencies were noted across tea gardens, with many participants hosting concerns surrounding inadequate support from managers as a barrier to breastfeeding. This results in a partial alignment with WHO practices, where sufficient feeding practices are reliant on local resources and cooperation of authorities.

Although studies have been carried out regarding insufficient feeding practices, this research better demonstrates the complexity of achieving breastfeeding guidelines in the specific context of tea gardens.

Participants described chronic food insecurity as a major contributor to child malnutrition. Due to financial constraints, families lacked the ability to produce

nutritiously diverse diets, instead reliant on rice and lentils. This food poverty is exacerbated by large family size and poor access to food markets. Prevalence of food insecurity in tea gardens was also described by Iqbal et al. where almost 90% of households in one region thought to be impacted (7).

According to the Food and Agricultural Organisation (FAO), food insecurity remains a significant challenge in rural India, with economic and geographical barriers limiting access to adequate nutrition (56). Participant insights are consistent with these difficulties.

Encouragingly, the introduction of community kitchen gardens for people working in the tea gardens has provided a low cost and sustainable implementation at addressing the food crisis in the areas studied. This implementation aligns with the United Nations Children's Fund (UNICEF) community nutrition models consisting of dietary diversity promotion through utilisation of community resources (57). However, community kitchen gardens are not universally available across tea gardens, providing an area of improvement to scale up such resources along with generating financial support.

These findings highlight the multifaceted nature of child malnutrition, shaped by structural barriers such as poverty, maternal employment and dietary diversity. Whilst efforts have been made to reduce this prevalence, systemic challenges remain unaddressed.

Theme Two: Healthcare Access

There are multidimensional challenges related to healthcare access in tea garden communities. These include distance, availability, cost and hesitancy. Findings revealed that although health services exist, a range of geographical, financial and

cultural barriers restrict access. The resulting outcome of these challenges includes treatment delay, decreased utilisation and poor health outcomes.

Studies have shown that physical distance is a substantial deterrent for healthcare utilisation (58,59). All participants in this research reported long distances, poor road conditions and limited availability of health professionals being core contributors to restricted health care access. Participants reported that most women must travel around 40-45 km to essential health services, often further restrained by non-reliable transport.

According to WHO, for equitable healthcare there must be emphasis on accessible services, especially when vulnerable populations such as pregnant women and children are compromised (19). Outreach initiatives, like CINI's efforts for a community ambulance service, aligns with WHO and the strong need for decentralisation of maternal and child health services (10,60). Literature from Biswas et al. reports high maternal deaths in relation to the preference of home deliveries over institutional births (58). However, all participants reported utilisation of hospitals by mothers was preferred to home births. One participant emphasised the change in attitude to this was due to the initiation of the community ambulance service. This is a significant finding of the study as it highlights a facilitator that has not been discussed in the literature. CINI's advocacy for this vehicle aligns with WHO goals of collaborating between transport and health to directly link rural communities with infrastructures (61).

The utilisation of home visits by community facilitators for the early identification of high-risk mothers and unwell children, was a mediator in addressing the lack of health professionals available. The role of the community facilitator acted as a

connector between mothers and healthcare institutions. However, the lack of availability of health professionals in institutions results in an increased number of identified but untreated mothers and children. Thereby, an increase in demand for local and institutional health workers is apparent.

Participants described antenatal checkups as sufficient, with mothers receiving four visits prior to birth and most receiving postnatal care in hospital. However, when compared to updated guidance from WHO, antenatal visits of these tea garden mothers fall out with the recommended amount of eight (62). This finding raises concerns surrounding the cause of this practice. Gaps in resources and knowledge need to be addressed to combat this discrepancy. However, more generally there needs to be health system strengthening. The community side is stronger due to the implementation of the local ambulance, however the healthcare side, such as antenatal care and monitoring, is lacking.

Financial constraints were another concern for participants regarding healthcare access. Whilst some government health services are free, tea garden workers cannot afford private healthcare, which is deemed better equipped and a higher standard. Participants highlighted disparities of financially available healthcare for women and children in tea garden communities.

This aligns with National trends. According to the India Health System review, a large proportion of all health spending (around 65%) is due to out-of-pocket (OOP) household expenditures (63). This need for OOP spending further exacerbates the health inequalities amongst the poorest. This study has highlighted that families in tea gardens do not have the income to prioritise these OOP expenditures over other basic needs such as food. Furthermore, Yadav et al. uncovered that OOP spending

led to fewer people seeking medical care, particularly amongst vulnerable communities (64).

Disparities across communities exist in the Anganwadi centres, implemented by the Government as part of their Integrated Child Development Scheme (ICDS) (26). Participants emphasised the need for reliant, available centres for programme delivery and health monitoring, stressing that this is not always guaranteed. Literature from Debata et al. also described lack of basic facilities such as toilets and clean drinking water at these centres, with inadequate government funding and education suggested as a cause to discrepancies in facilities (65).

Health seeking hesitancy was seen to be driven by low literacy levels, cultural beliefs and insufficient family support. Reluctance was particularly prominent with vaccination uptake, hygiene practices and antenatal checkups.

These findings reflect literature on cultural and educational barriers for utilisation of health care. Majumder et al. highlights gender inequalities undermining women's autonomy in their healthcare decision making (66). This reflects findings of this research. Women were discouraged to attend health initiatives as it was seen by their elders and husbands to be neglectful to their household duties. Similarly, Biswas et al. highlighted unawareness from husbands surrounding pregnancy resulted in poor decision-making during labour, leading to maternal complications (58).

Participants discussed the educational barriers faced when implementing health programmes. Varying levels of education between mothers and families led to extra time taken for repeated conversations to relay health messages.

CINIs response to mitigate these barriers in the form of sensitisation programmes with all members of the family, aligns with WHO recommendations for holistic care giving, with emphasis on the importance of involving all caregivers in health information sharing to increase capabilities (60).

Theme Three: Structural Socioeconomic and Employment Constraints

There are structural barriers that restrict the ability of mothers to engage in meaningful healthcare and caregiving practices. These issues are deeply intertwined, with poverty enforcing long working hours and decreased maternity engagement, ultimately undermining poor child health outcomes. Results highlight the need to address systemic labour and economic inequalities for sustainable health improvements.

Grounded in famine and poverty, Sen's capabilities approach highlights that poverty is not just a lack of income but a denial of basic capabilities, including healthcare access (67). Participants consistently described chronic poverty to be affecting the ability of tea garden workers to meet basic health needs. The average earning of women workers equated to around £2.50, leaving little room for expenditure on healthcare and proper nutrition. Poverty was underscored by participants as a major contributor to malnutrition and poor maternal health as discussed previously.

These findings are consistent with those of Majumder et al. who concluded an unsatisfactory quality of life for tea garden workers due to poverty (68). This led to social exclusion from various opportunities such as education and health care (68).

Essential for achieving Sustainable Development Goal 3 (SDG 3) "to ensure healthy lives and promote well-being for all at all ages" (25), WHO recognises that economic stability for marginalised communities must be achieved (25). However, the tea

garden context reflects an environment where structural deprivation remains a barrier to advancements in health outcomes.

Inflexible, long working hours was a major barrier to mothers participating in health promoting programmes or adequate feeding practices as mentioned previously. Maternal knowledge surrounding nutrition and health often exceeded their capabilities to apply it. This is strongly echoed in findings by Hyde et al. where time poverty is highlighted as an unequal burden on working women, rooted in gender inequalities and threatening women's' rights to health and the health of their children (69).

UNICEF emphasises the importance of workplace support for breastfeeding in the form of breaks and child friendly spaces, noting that this significantly promotes exclusive breastfeeding and a reduction in infant mortality (70). Although some participants noted the positive impact of a garden creche, which facilitated breastfeeding during working hours, this was not a universal facility. This research demonstrates the difficulties faced in implementing space and labour resources, causing the inability of mothers to take breaks for breastfeeding.

CINI's reactive nature of implementing programmes around workers' schedules- such as meeting women during tea weighing time- aligns with a community responsive approach, consistent with WHO's recommendations for integrated, people centred services (60).

Other studies give additional insights of employment health risks. For example, it was observed by Kumar et al. an association between tea plucking occupation and low birth weight newborns, with prolonged labour causing foetal growth restrictions (13). However, these specific issues were not widely discussed by participants due

to the inability to access birth weight data and specific details of labour practices. However, this study did give further insights than literature surrounding the specific time constraint implications on health engagement and feeding practices, with employment being a major barrier. Current strategies are not sufficient in addressing these constraints in this population. More needs to be done to develop better practice to better meet this population's needs.

Pregnant women in tea gardens often lack adequate workplace support and maternity provisions. Participants reported that some women continue to work until seven to eight months of pregnancy, while others received no wages during maternity leave- particularly in closed tea gardens. The psychological and physical strain of working during pregnancy was a major concern, with women frequently forced to choose between income and health, placing maternal and newborn well-being at risk.

Under the Maternity Benefit Act, women are entitled to 26 weeks of paid maternity leave (71). In principle, tea garden workers- such as the women discussed by participants- should be covered under both the Maternity Benefit Act and the Plantation Labour Act (72,73). These laws mandate maternity support, healthcare access and childcare facilities.

However, as highlighted by participants, enforcement of these protections remains weak. Reports indicate that women in informal employment, which includes a large majority of tea garden workers, are often left without adequate protection or security under these Acts (71).

Moreover, the implementation of maternity-related policies is hindered by lack of awareness among women, often due to limited education or fear of speaking out

against employers (71). Employers, in many cases, have also been found to be non-compliant with these mandates (71). There is an evident lack of governing oversight, and responsibility for health and well-being of tea garden workers is neither clearly defined nor widely understood.

In the absence of structured pre- and postnatal support, participants described the role of bridging the gap by gathering support from management. However, without strong labour protections, resources and maternity protections are reliant on managerial cooperation and discretion, therefore a variable across tea gardens.

Theme Four: Advocacy and Community Collaboration

Advocacy and community mobilisation act as enablers of improved child health outcomes. Findings emphasised the value of locally driven health promotion strategies, advocacy approaches and continuous engagement efforts. These elements not only foster health behaviour change but create a sustainable link between garden communities and recommended health practices.

Participants described locally led initiatives, along with cooperation between other community workers (ASHAs, ANMs, CHOs etc), functioned as significant facilitators of increasing health awareness and service uptake. Initiatives such as ‘Breastfeeding Week’ and ‘Nutrition Month’ were widely attended, creating community cohesiveness and information sharing among women. This echoes findings in wider literature, notably Rosato et al. who emphasised community mobilisation as a responsive solution to improved child health outcomes (74). On the other hand, continuous home visits by health workers were used for a more direct approach towards engagement of those who needed it.

The success of initiatives from CINI suggests community mobilisation acts as a catalyst and platform for ongoing health improvement. However, contingencies arose around cooperation of tea garden management, with programmes heavily reliant on their support on a case-by-case basis. This raises concern surrounding personality driven outcomes, with no regard for accountability from management roles.

Advocacy was a persistent and intentional strategy described amongst participants across multiple avenues in their work. Participants report using advocacy for 1. Gaining support (of managers and external stakeholders) 2. Encouraging engagement (especially aimed towards families) and 3. Influencing local government services (regarding NRC transportation).

In this research context community facilitators served as not just the service providers but as agents of change, advocating for resources and accountability.

Peer advocacy was also observed to create a ripple effect within the community. One participant highlighted the informal role grandparents took in the promotion of the NRC, advocating to other families its importance. This peer led advocacy resonates with findings from Simoni et al. where peer to peer interventions create empowerment and engagement within communities, leading to sustainable behaviour change (75).

Participants recognised CINI's role as one central enabler to health improvements within tea gardens. Specific emphasis was placed on its function as a mediator between grassroot needs and institutional systems. Through utilisation of growth monitoring charts, home visits and structured awareness sessions, CINI practices aligned with WHO standards, whilst maintaining its ability to adapt to local realities (18,19,60).

Participants also highlighted disparities between CINI supported, and non- supported tea gardens, with the former showing better child health outcomes and improved maternal engagement. However, frustration resides over resource constraints, with participants highlighting NGO capacity is currently not sufficient to address systemic inequities. This reinforces the importance of integrated models through cross sector collaboration and recognition of the role of health systems strengthening work at all levels.

Cross Cutting Factors

Two cross cutting issues emerged across all themes: poverty and advocacy. These systemic factors shaped both the barriers and facilitators to improving child health in tea garden communities and offer insight into the interconnected nature of the challenges identified.

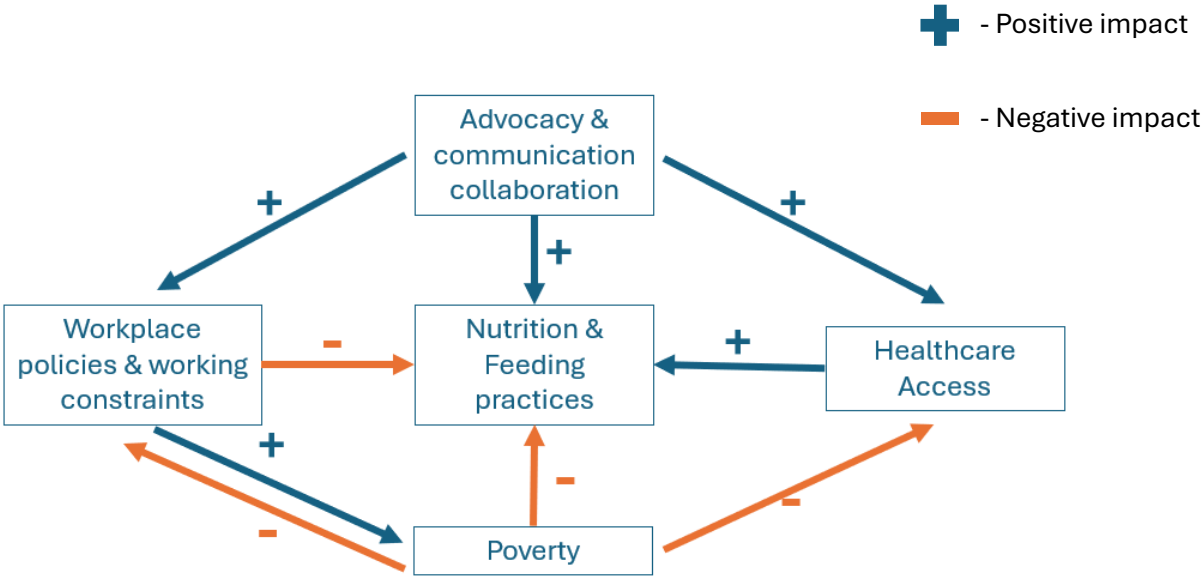

Figure 6- Outline of the interrelation between themes identified

Structural Inequity and Poverty as Overarching Barriers

Poverty was a foundational barrier across all themes, influencing nutrition, healthcare access and maternal engagement. Chronically low wages left families unable to afford diverse diets, optimal healthcare or time off work.

Beyond income, structural inequalities existed such as variation in tea garden management, lack of maternity leave, and poor infrastructure. There were extreme disparities, especially in closed tea gardens, where support during pregnancy was severely lacking.

The concept of capability deprivation is highlighted in tea gardens, where poverty constrains not only resources but access to health (67). Therefore, addressing child health in these communities requires tackling structural and systemic inequalities, not just individual behaviours.

Advocacy as an Overarching Facilitator

Advocacy emerged as a consistent facilitator. Participants described advocacy with management, government and families to gain access to transport, creches and programme implementation. Advocacy played a significant role in shaping attitudes towards breastfeeding, child health and service use.

Participants noted that advocacy empowers mothers in health knowledge and rights, creating active participants from passive recipients.

As opposing forces, advocacy and poverty help highlight the requirement for integrating both structural reform and community-led advocacy to navigate and transform improved sustainable child health outcomes in tea gardens.

5.2 Strengths and Limitations

Strengths

All participants were based in India, therefore online interviews via Microsoft Teams were able to overcome any geographical barriers. This software also allowed for transcription of interviews.

The purposive sampling method via CINI ensured that participants had a deep knowledge and understanding of the health of the populations within the tea gardens. The Community Facilitators work closely with the women and children, therefore were able to provide valuable insights regarding the aims of the research.

Although there were language barriers, the use of an interpreter allowed for reliable translation of the interviews. Moreover, this being an interpreter who is a native speaker adds to the reliability of information that was interpreted. The interpreter was also immersed in the community, therefore understood any local terminology or descriptions.

CINI is always adapting to current data and information to develop initiatives in a growing country. This research provides a base of recommendations which could influence funding and policy directions.

Limitations

This study also had several limitations, discussed in Table 4.

Table 4- Study Limitations

Limitation	Details
Homogenous sample size	Participants interviewed were all in the same field of work as a Community Facilitator. Views from other workers within the tea gardens may have provided a wider scope of barriers and challenges in different child health areas. However, the sample size allowed for sufficient depth of data collection to answer the research questions.
Researcher Inexperience	Research carried out by a first, time novice researcher may create discrepancies surrounding efficient data collection and complete analysis of results (76). Efforts were taken to bridge this knowledge gap through support and guidance of supervisors and other experienced researchers.
Researcher Designed Interview Guide	The interview guide was curated and not tested in any other studies. However, questions were designed after careful review of current literature and in discussion with both academic and locality supervisor to ensure questions were relevant and culturally appropriate.
Time Constraints	Due to timings of ethical approval and deadline of project submission, interviews had to be carried out in the same week as back-to-back sessions. This limited the ability for reflective practice between interviews to adjust or adapt research questions accordingly.
Use of Interpreter	There was an added complexity when the need to use an interpreter from same locality is involved. In future research, an outside interpreter should be used to minimise potential uncomfortable and conflicting power dynamics.

5.3 Bias

Biases from both the researcher and participant is detailed in Table 5, along with any ways these were minimised.

Table 5- Outline of Biases

Bias	Description
Researcher Bias	Researcher bias can manifest in different ways. Researcher bias can manifest if there are preconceived ideas or assumptions surrounding the research being examined. Confirmation bias describes the tendency to seek, interpret or remember data in ways that confirm researcher's preconceptions or hypotheses, whilst ignoring evidence that contradicts (77). As there was already previous knowledge surrounding the topic of tea gardens, through reading the literature, there is likely to have been an unconscious bias, potentially influencing the interpretation of the results. To minimise bias, reflexive practice was carried out to examine how personal experiences may have influenced data interpretation (47). In addition, the utilisation of peer debriefing was used, to discuss findings and interpretations with supervisors and colleagues, to identify blind spots and biases.
Participant Bias	Given the nature of the research, and the knowledge of participants that there was an element of evaluation of CINI, there is a risk of social desirability bias (78). As staff members of CINI, participants may have felt inclined to portray their work in a favourable light. Carrying out multiple individual interviews, attempted to reduce the scale of this bias. The interpreter used was also a staff member from the organisation, which may have affected the participants openness. There is also a risk of

	interpreter bias, where responses from participants may have been shaped, either consciously or subconsciously, by the interpreter's position within the charity (49,79). To reduce participant bias, participants were informed that responses would remain confidential, and that the researcher was independently conducting the study. However, to minimise interpreter bias further future research should be conducted with an interpreter out with the organisation being studied.

5.4 Recommendations

This study aimed to provide recommendations for future practice, policy and research. These are outlined in Table 6 and Table 7.

Table 6- Recommendations for Future Practice and Policy

Recommendation Description	Reasoning
Establish a local/national platform for female tea workers to advocate for their rights	Advocacy was a significant and prominent enabler of improved healthcare access, increased nutrition and community cohesiveness. All participants expressed advocacy's role in their jobs on a day-to-day basis, but also at strengthening the impact of CINI at an institutional level. An example of this is from Sri Lanka, where women on tea plantations face many of the same difficulties as those discussed in this study (80). A coalition of NGOs and local women's groups developed village-level women's development centres, that lead to a negotiation for maternity leave, workplace safety and creche access (80). This ultimately increased women's representation in tea garden management discussions.

	Establishing a platform for female tea workers to advocate for their rights would facilitate the sharing of experiences and advocate for their health and labour rights, equating to policy improvement and increase time to focus on their child health care.
Establish community-based services and mobile health units	Access to healthcare proved a significant barrier to children and their mothers accessing vital healthcare. Participants described major barriers such as long distances to health centres, unreliable transport and limited availability of doctors and nurses. In Ethiopia, a Health Extension Programme provides a model of how community-based services and mobile outreach can overcome barriers of poverty and remoteness (81). CINI's current approach of the community ambulance and utilisation of home visits align with decentralised health units, however there are significant imbalances in system, and needs to be strengthened overall. Implementation of more established community-based services and mobile health clinics could significantly improve access to maternal and child healthcare.
Increase the number of established community kitchens and creches	Malnutrition was a dominant health challenge faced by children in the tea garden communities. Poverty and maternal labour constraints exacerbated this health challenge. Exclusive breastfeeding was a challenge due to work commitments and dietary diversity was shown to be caused by poor income. CINI's implementation of creche facilities and community kitchens were effective in addressing these systemic barriers, however they were not universally present. It aligns with Brazil's implementation of community kitchens and early childcare facilities (82). They were evaluated to reduce time

	poverty and allowed for increased engagement in health programmes. These implementations were government supported initiatives and established across communities. The expansion of these resources in tea gardens in India would complement CINI's efforts and directly address nutrition and caregiving barriers.
Work towards recognition of female tea workers in maternal care policy	A key structural barrier identified in this study is lack of formal policy recognition for women within India's maternal health and labour frameworks. There is no consistent access to maternity leave, income support or workplace health services. Lack of awareness of legal rights, weak regulation, and management neglect contribute to this gap. To ensure safer pregnancies and improved child health, female tea workers must be explicitly recognised in maternal care policy. Along with this there should be a goal for stronger enforcement, rights awareness and accountability across tea estates.

Table 7- Recommendations for Future Research

Recommendation	Description
Conduct a meta-synthesis of evaluations on health outcomes for women tea pickers in India with a focus on employment barriers	It is apparent from this study that child health outcomes are deeply affected by women's working conditions in tea gardens. Numerous studies have examined malnutrition, feeding practices and healthcare access, however few have synthesised these with a lens of maternal or employment related constraints. To build on this study, a meta-synthesis would allow for integration of findings to highlight patterns of disparities and barriers to child health outcomes.
	Whilst this study evaluated that there is a range of CINI models, and they align with WHO best practices,

Develop a theory of change for how and why health outcomes improve for tea children in these communities	future research for CINI should be targeted at developing a Theory of Change (ToC) to map how and why child health outcomes improve in tea garden communities through their community-based interventions (83). This would also help to provide a source for scaling up, replicating and evaluating CINI work across other settings.
Share findings of research with participants/CINI/local network and discuss usefulness of findings to their practices	A key recommendation following this study is to share and discuss findings with CINI and relevant stakeholders. CINI facilitators provided rich, experience-based data about working in tea garden communities. In line with this study's focus on advocacy and community ownership it is fitting and beneficial to close the loop and engage participants. Sharing results with those who contributed demonstrates ethical accountability and respect, which are core aspects of participatory research. It stops perpetuating what can be a very extractive process and can help strengthen future practices.

Chapter 6- Conclusion

This research set out to explore the barriers and facilitators to improving chid health outcomes in rural tea garden communities in North-East India, with particular focus on the implementations of CINI. Through a qualitative approach, grounded in phenomenology that focussed on the lived experience of CINI community facilitators

The findings revealed a complex interconnection of structural, socioeconomic and cultural barriers that impede child health and development. Most notably widespread poverty, food insecurity and maternal employment constraints had a large impact. These barriers significantly limit the ability of mothers to provide adequate care and nutrition to children. Importantly, the research also revealed significant facilitators that support health improvement such as community-based advocacy, targeted education programmes, home visits improving healthcare access and support from CINI.

There are a multitude of overlaps amongst themes identified, with particular significance in this study. First, poverty functioned not only as a lack of income but as a barrier that influenced nutrition, care practices and access to healthcare. Secondly, advocacy was a significant facilitator that served as a form of communication tool to empower and educate within the community.

Crucially this research demonstrates that CINI's work is closely aligned with world health standards, particularly in nutritional rehabilitation, promotion of exclusive breastfeeding and community outreach. However, despite these successful interventions, persistent structural disparities including insufficient healthcare infrastructure, lack of maternity policies and inconsistent managerial support continue to slow progress.

This research therefore emphasises the need for coordinated, multi- sector approaches when targeting improvements in child health.

These findings directly respond to the research aims and contribute to the limited body of lived experience qualitative literature on tea garden communities. This study, by centring the perspectives of community facilitators, highlights the complexity of improving child health outcomes in marginalised rural tea gardens and offers important insights for NGOs and policy makers.

Most importantly, at the centre of change must be the voices of the community, to build capacity and bridge the gap between this vulnerable population and institutional systems. Ultimately aiming to achieve equitable healthcare for not just children in these communities but everyone.

6.1 Personal Project Reflection

Undertaking this research project has been a gratifying and engaging process. It offered the opportunity to deeply engage with a global health issue and work in collaboration with an NGO. Throughout the process, I not only strengthened my academic and research skills but also developed a greater awareness of the practical and emotional dimensions of conducting qualitative research in real world contexts.

As a researcher positioned outside of the community, I was aware throughout that power dynamics can be part of the research process. I was collecting accounts, but the facilitators and communities were the ones living these challenges daily. I did not want to be extracting information for academic purposes only, therefore I am wanting to ensure that the research would contribute to broader conversations on health policies and practices, as well as providing CINI with valuable information for their own strategy improvements.

Importantly, I am deeply aware of the historical and ongoing colonialism that shapes many of the challenges uncovered in this research and tea gardens as a community. With this awareness, I approached the research with cultural sensitivity, ensuring that community practices were not portrayed in a judgemental way. My outcome for this research project was to amplify voices of local facilitators and use language that respects context, avoids negative framing and implements decolonial research values.

One of the most significant aspects of this experience was learning how to conduct and interpret qualitative interviews. As an inexperienced researcher, I was apprehensive in carrying out a task that was vital for the research but also something I had no experience in. There was even more apprehension having to conduct interviews with an interpreter. At times, I found it difficult to fully grasp the emotional weight or meanings behind responses and felt uncomfortable at sometimes to ask for answers to be repeated. This highlighted the complexity of cross-language qualitative research and the importance of building strong rapport with not just the participants, but with the interpreter, to be able to have meaningful discussions. I felt I was able to draw on my skills learned from communication skills in MBChB course to help guide me throughout the interviews.

Collaborating with an external stakeholder, was a rewarding element of the project, that also brought some complexities. Partnership with CINI provided access to participants and an interpreter, along with helping to provide context and understanding around the project. However, a significant challenge was a delay in receiving ethical approval, which postponed the start of field work. This experience revealed the practical difficulties of cross-party research, particularly when working across different institutions and time frames. Aligning my research deadlines with priorities from the charity was not always straightforward, but it taught me the value of open communication and flexibility when working with partners in research.

Looking ahead, I would like to remain a critical thinker and develop my research abilities. To improve my skills, I will continue to engage in literature reading- a skill which I found difficult to grasp, and still very much learning how to do effectively. If I was to need interpretation in future research, I would ensure that more of a relationship was built between myself and the interpreter, to help establish rapport and align on the same page regarding research questions. Timing was a difficult constraint for me to manage, and in future I will be able to better adapt to the unknowns of the challenges that inevitably come with research. Creating provisional deadline plans and targets would help with this.

This research has given me a greater insight into the livelihoods of a very vulnerable population, and I have great appreciation for the position to be in to hear of these lived experiences.

Overall, this research has taught me valuable skills in communication, time management and looking at things with a more critical lens. All of which I can take further in my future career in medicine.

Figure 7- Reflection on the project by the researcher

Chapter 7- References:

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Chapter 8- Appendices

Appendix 1 - Participant Information Sheet

Participant Information Sheet for Staff Members of Child In Need India

Exploring the Barriers and Facilitators to Improve Child Health Outcomes within a Rural Tea Garden in Assam

University of Dundee School Research Ethics Committee Application/Approval Number: [*insert approval number from decision letter*]

You are invited to take part in a research project. Before you decide whether you would like to participate it is important that you read the information provided below. This will help you to understand why and how the research is being carried out and what participation will involve. Please let the researcher who gave you this information know if anything is unclear, or you have any questions.

Who is conducting the research?

Principle Researcher:

Anna Ramsay, Intercalating MBChB Student, University of Dundee, United Kingdom.

2443097@dundee.ac.uk

Supervisors:

Dr Paige Linnell, UK director of Child in Need India

Dr Dhruva Somasundara, Clinical Lecturer, School of Medicine, University of Dundee, United Kingdom

Who is funding the research?

This research is self-funded.

What is the purpose of the research?

This research aims to investigate the barriers and opportunities for improving child health outcomes in Tea Gardens in India. In addition to investigating local barriers and facilitators, the study will research current best practices for enhancing child health outcomes. This will help provide a benchmark and strategies for improving programme initiatives in the environment of rural tea gardens.

The goal is to develop evidence-based recommendations that can strengthen the impact of Child in Need India's programs and improvements in child health outcomes.

Why have I been invited to take part?

You have been invited to take part because you are a staff member of Child In Need India. Your personal experience in this organisation will provide insight into the

current barriers and facilitators for improving healthcare in Tea Gardens, as well as current health of mothers and children.

Do I have to take part?

Taking part is voluntary, choosing not to take part will not disadvantage you in any way. You can withdraw anytime up to 14 days after the interview without explanation. Beyond this point it may not be possible to withdraw as the data will be anonymised.

What will happen if I take part?

If agreeing to take part you will be invited to participate in an interview with the primary researcher, lasting up to a maximum of one hour. This will be carried out online, with the use of Microsoft Teams. These interviews will be audio-recorded then transcribed. The data gathered from your interview will be anonymised and the recordings will be deleted.

Are there any risks in taking part?

There are no risks in taking part in this research. You do not have to disclose any information that you find distressing and you have the right to stop the interview at any point without providing a reason. The questions relate to health care facilities and support that are available to women working in the tea gardens. CINI ethics committee has agreed to its employees participating in this research project.

What are the possible benefits of taking part?

The information you provide will be helpful for the researcher to understand the healthcare support for women working in the tea gardens. This in turn will help identify current practices that are beneficial to these women and children and make recommendations on how health care can be improved for these women, therefore, to improve current child health programmes within CINI.

Will my taking part in this project be kept confidential?

As mentioned previously, all information collected will remain anonymous and confidential and will be kept on a secure OneDrive that only the researcher and supervisors have access to.

It is important to note that the researcher may have to break confidentiality if they feel there is any potential harm or danger to participants or others, or criminal activity, to the relevant
authorities, such as information relating to terrorism, money laundering or child abuse.

What will happen to the information I provide?

The interviews will be recorded using the in-built software on Microsoft Teams. The recorded data will be anonymised and transcribed. Recordings of interviews will be deleted after being transcribed. Transcribed data will be held on a secure One Drive, which will only be accessible to the researcher and supervisors. Anonymised data will be stored for 10 years in line with University of Dundee Research Governance &

Policy Subcommittee Code of Practice for Non-Clinical Research Ethics on Human Participants. Data might be deleted prior to that but will not be stored beyond this time.

Upon completion of this research, findings will be submitted to the University of Dundee. The research could be submitted for publication in peer reviewed journals. Results will be anonymous, and individuals cannot be identified. Only anonymised, published data will be available for future research.

Data Protection

The personal data that will be collected and processed in this study are:

- Personal role within CINI
- Personal experiences and reflections
- Personal perceptions and opinions

The University asserts that it is lawful for it to process your personal data in this project as the processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller.

The University of Dundee is the data controller for the personal data processed in this project.

The University respects your rights and preferences in relation to your data and if you wish to update, access, erase, or limit the use of your information, please let us know by emailing *Anna Ramsay 2443097@dundee.ac.uk.* Please note that some of your rights may be limited where personal data is processed for research, but we are happy to discuss that with you. If you wish to complain about the use of your information please contact the University's Data Protection Officer in the first instance (email: dataprotection@dundee.ac.uk). You may also wish to contact the Information Commissioner's Office (https://ico.org.uk/).

You can find more information about the ways that personal data is used at the University at: https://www.dundee.ac.uk/information-governance/data-protection.

Is there someone else I can complain to?

If you wish to complain about the way the research has been conducted please contact the Convener of the University Research Ethics Committee (https://www.dundee.ac.uk/research-governance-policy/non-clinical-research-ethics-contacts). You have the option to email the Convener or leave a voicemail.

Alternative formats

The researcher should offer to provide a copy of the Participant Information Sheet and Consent Form in alternative formats (e.g. large print, Braille). Advice on alternative formats can be obtained from Disability Services (email: altformats@dundee.ac.uk).

Appendix 2 - Informed Consent Form

Informed Consent for 'Exploration into the Barriers and Facilitators to Improve Child Health Outcomes within a Rural Tea Garden in Assam' Research

1. Taking part in the study	**Yes**	**No**
1a. I have read the Participant Information Sheet, or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.		
1b. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study during or up to two weeks after the completion of the interview, without having to give a reason.		
1c. I understand that taking part in the study involves an interview of a maximum of 1 hour with the researcher, that will be audio recorded and then transcribed.		

2. Use of the information in the study		
2a. I understand that information I provide will be used for the researcher's project for their BMSc in Global Health at the University of Dundee.		
2b. I understand that personal information collected about me that can identify me, such as my name or where I live, will not be shared beyond the study team.		
2c. I agree that anonymised direct quotes can be used in research outputs.		

3. Future use and reuse of the information by others[1]		
3a. I give permission for an anonymised transcription of my interview will be stored for up to 10 years in the researcher's University of Dundee One Drive in accordance with the University of Dundee's policy.		

[1] Please refer to Forms A and B: Additional Guidance on Data Management

4. Signatures

Participants Name:	
Participants Signature:	
Date:	

By signing above, you are indicating that you have read and understood the Participant Information Sheet and that you agree to take part in this research study.

Name of Researcher:	
Signature of Researcher:	
Date:	

For participants who have difficulty reading the Participant Information Sheet and Consent Form, and/or signing the consent form, there is an alternative form of gaining informed consent.

Participants Name:	
Date:	

[Researcher completes participant's name and date]

Participants unable to sign their name should mark the box instead of signing:	

I have accurately read out the Participant Information Sheet and Consent Form to the potential participant. To the best of my ability, I have ensured that the participant

understands what they are freely consenting to and have completed the Consent Form in accordance with their wishes.

Name of Researcher:	
Signature of Researcher:	
Date:	

I have witnessed the accurate reading of the Participant Information Sheet and Consent Form with the potential participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of Witness:	
Signature of Witness:	
Date:	

If the participant is unable to mark the box but is able to indicate consent orally, or in another manner, then the signatures of the witness and the researcher will be sufficient. In such cases the researcher should indicate below how consent was given.

Form of consent for participants unable to provide a signature or to mark the box:

5. Study contact details for further information

Anna Ramsay

Email – 2443097@dundee.ac.uk

Dhruva Somasundara

Email- d.z.somasundara@dundee.ac.uk

Paige Linnell

Email - paige@cini.org.uk

6. Alternative formats

The researcher should offer to provide a copy of the Participant Information Sheet and Consent Form in alternative formats (e.g. large print, Braille). Advice on alternative formats can be obtained from Disability Services (email: altformats@dundee.ac.uk).

Appendix 3- Interview Guide

Question Guide

Hello, it's lovely to meet you. Thank you for agreeing to participate in an interview today. My name is Anna, a BMSc student in Global Health at the University of Dundee and primary researcher for this research project looking into the facilitators and barriers to improving child health outcomes in Tea Gardens in India.

I'm now going to start the recording.

Thank you for agreeing to participate in an interview today, before we get started can I first make sure you have received your participant information sheet and signed the consent form?

Today I'll be asking a few questions about your role within Child In need India and about your experiences within the Tea Gardens. Do you have any questions before you consent to this interview?

About them

1. So just to begin could you start by telling me about yourself, your job title and role within Children In Need India
    a. How long have you been doing this for?
    b. What does this role involve on a day-to-day basis
2. Can you tell me a bit about the populations you work with?

a. In your experience, what are the key health challenges faced by children and mothers in rural tea garden communities?

Health Demographic

1. What areas within childhood health do you feel need focus on?
    a. E.g. maternal nutrition, early childhood feeding
2. What areas within maternal health do you feel need focus on?

Existing Support

1. Can you tell me about any existing support for pregnant women and children within the tea gardens
    a. Are there any programmes you've seen that are especially successful?
    b. If so why?
2. How do women and children access healthcare on tea plantations?
3. In terms of work, do pregnant women who work on the tea gardens get extra breaks or resources of help?
4. After giving birth, what support do women have?
    a. do they have child feeding breaks?
    b. What does this look like?
5. I understand that community leaders within tea gardens are responsible for the oversight of the tea gardens workers health and wellbeing, what are your experiences with engaging with community leaders?

Challenges

1. Have you come across any challenges you have seen in engaging mothers or children with existing programmes?

2. What structural challenges do you believe make it difficult for a programme to be successful?
3. Are there any cultural barriers faced when implementing programmes?
4. Are there any gaps in resources, training or support?

Child in Need Specific

1. Based on your experience, what changes or additions to Children in Need India's programmes would have the most significant impact?

2. Are you aware of any global best practices from organisations such as the World Health Organisation about improving child health
    a. Are you aware of any global strategies that could be adapted within CINI

Closing

1. Is there anything else you feel is relevant that you would like to share that we haven't discussed

Appendix 4 - UoD Ethics Approval

University of Dundee

SREC Standard Decision Letter Template

Version 3, 11 May 2023

Schools of Medicine and Life Sciences Research Ethics Committee

Anna Ramsay
University of Dundee

14 March 2025

Dear Anna

Application Number: UOD-SMED-SLS-UG-2025-25-15

Title of Project: Exploring the Barriers and Facilitators to Improve Child Health Outcomes within a Rural Tea Garden in North East India

I am writing to advise you that your ethics application has been reviewed and approved on behalf of the Schools of Medicine and Life Sciences Research Ethics Committee.

This approval is subject to the researcher ensuring that they comply with University and national COVID-19 guidance in the country where the research is being conducted.

Any changes to the approved documentation (e.g., study protocol, information sheet, consent form) must be approved by this SREC before the changes are implemented. Requests for amendments should be requested using the Post-Approval Request for an Amendment form.

Approval is valid for the duration of the project, as stated in the original application. Should you wish your study to continue beyond the stated project end date, you must request an extension to this approval using the Post-Approval Request for an Extension form. The extension request must be lodged during your period of study and the period requested must not extend beyond the deadline for submission of your research project.

Yours sincerely

Dr Carlos Wigderowitz
Honorary Clinical Senior Lecturer
Convener, Schools of Medicine and Life Sciences Research Ethics Committee

Appendix 5 - CINI approval

Child in Need Institute

Communication of Decision of the Institutional Ethics Committee (IEC)

Date: 28.02.2025 IEC No: 03/02/2025

Study title: Exploration into the Barriers and Facilitators to Improve Child Health Outcomes within a Rural Tea Garden In Assam
Principal Investigator: Anna Ramsay
Name and Address of Institution: School of Medicine University of Dundee, Ninewells Hospital & Medical School, Dundee, United Kingdom
√□New review □Revised review □Expedited review
Date of review (D/M/Y) : 24.02. 2025 Date of previous review, if revised application: NA
Decision of IEC √□ Recommended □ Recommended with suggestions □Revision □Revision □ Rejected
Suggestion/Reasons/Remarks: None
Recommended for a period of six months only

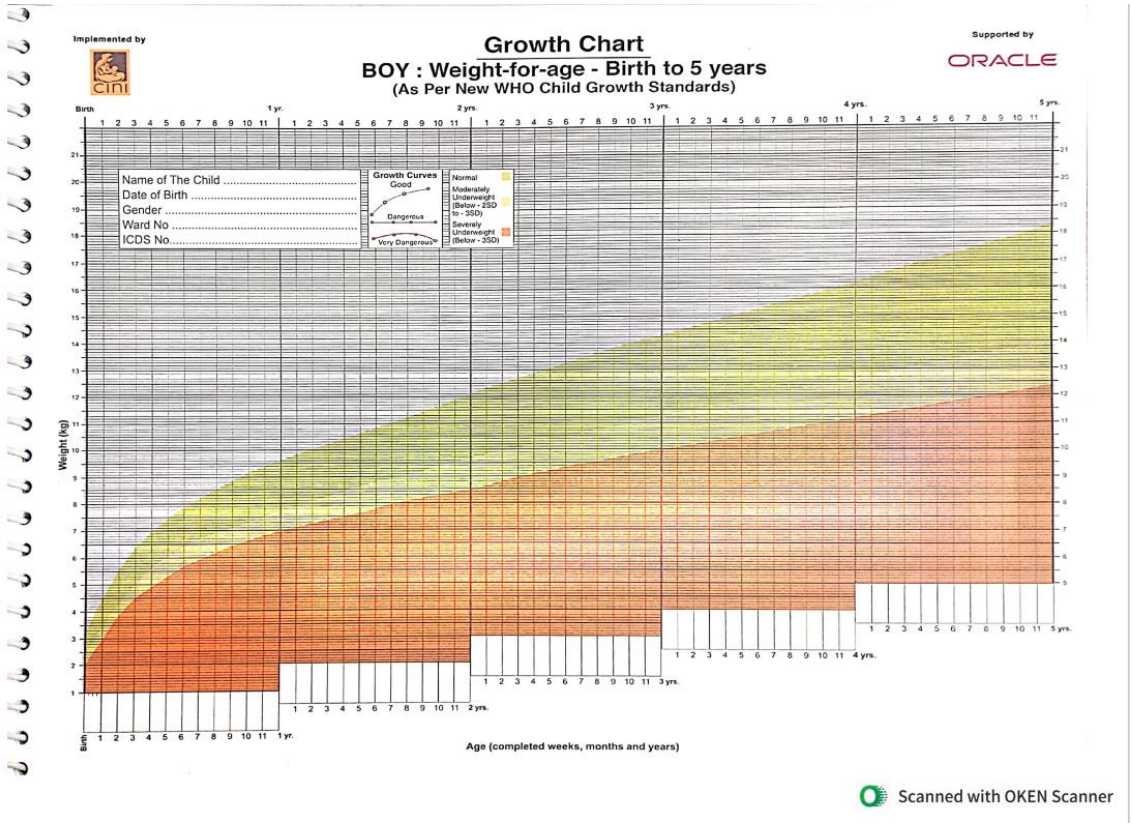
Please note

- Inform IEC immediately in case of any adverse event and serious adverse events
- Inform IEC in case of any change of study procedure, site and investigator
- This permission is for a period mentioned above. Annual report to be submitted to IEC • Members of IEC have a right to monitor the study with prior intimation

Sharmila Sengupta

Prof. Sharmila Sengupta
Chairperson

Appendix 6- Growth Chart



Health chart used by Community Facilitators and Health workers on the tea gardens to monitor children's growth and to help mothers visualise where their child was at in terms of healthy weight, underweight or overweight.

Appendix 7- Visual Nutrition Guide

Visual guide used by Community Facilitators to help facilitate good nutrition practices. Healthy, balanced food items are set out in the colours of the India flag: Orange, White and Green.