



# Reflections on Developing and Implementing a Participatory Learning and Action Intervention Addressing Diabetes in Ghana

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## Abstract

Ghana is a country facing a rapid increase in type 2 diabetes (T2D), yet resources and addressing the causes and consequences of T2D on individuals and communities is challenging. Participatory Learning and Action (PLA) is a community intervention that can improve health following a cycle of identifying problems with communities, planning and implementing solutions to address the problems, and reflecting on them. This approach has proved effective in addressing T2D and other health outcomes in low resource settings. This paper reflects and reports on the development and pilot implementation of PLA to address T2D in a poor urban area of Accra (Ga Mashie), from the perspective of the research team. Drawing on discussions, research notes and team meetings, we report on the process of the intervention development and implementation, challenges, lessons learned and the extent of participation. PLA proved feasible and popular. We (the research group) worked closely with community members through a community advisory group and workshops. Problems identified included low knowledge of risk behaviours and structural factors. Solutions implemented were a series of community events focusing on knowledge and raising awareness. Challenges included: time constraints, logistical difficulties, ensuring decisions were not over-influenced by researchers and sustainability. Our findings indicate that the successful implementation of interventions requires careful organisation, reflection throughout and needs to be built on genuine trusting relationships. The insights gained from this study offer valuable lessons on how PLA may be implemented and considerations needed for similar settings.

**Keywords** Type 2 diabetes · Non-communicable diseases · Participatory learning and action · Ghana

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## Introduction

There is an urgent need to address the growing burden of type 2 diabetes (T2D) in Ghana and other sub-Saharan African (SSA) contexts. An estimated 79% of adults living with T2D are in lower and-middle income countries (LMIC) (Kengne, 2024). Over two-thirds of the rise of T2D globally can be accounted for in SSA (Atun et al., 2017). In Ghana specifically, the estimated number of cases of T2D has nearly tripled over the past 20 years (Asamoah-Boaheng et al., 2019). While T2D was estimated to affect 2.8–3.95% of the Ghanaian population in 2023 (Kazibwe et al., 2023), the actual prevalence may be notably higher as research suggests that a lack of diagnosis is likely substantial due to a critical knowledge gap and a lack of access to screening opportunities and healthcare facilities (Hormenu et al., 2024). A systematic review of the prevalence and risk factors of diabetes in Ghana, highlighted that prevalence was higher in southern regions, namely Cape coast and Accra, than in other regions (Asamoah-Boahen et al., 2019).

The rapid increase in T2D means already-overburdened health systems are unable to cope with the burden of T2D and its associated complications (Atun et al., 2017). This is largely a result of the double burden of infectious and chronic diseases within SSA contexts, with a lack of prioritization in health policy resulting in inadequate guidelines, healthcare personnel, formal training, diagnostic equipment, and medications to effectively manage non-communicable diseases (NCDs) (Amoah et al., 2002; Atun et al., 2017). NCDs such as T2D and associated risk factors are rapidly emerging as the leading causes of death within these contexts, overtaking infectious diseases (Atun et al., 2017). Furthermore, these diseases affect poor communities disproportionately, exacerbating poverty and creating long-term psychosocial challenges (de-Graft Aikins, 2014). On a macro-economic level, T2D and its consequences cost countries 1–2% of their gross domestic product, placing strain on LMIC economies. Thus, considering the immense health, social and economic burden of T2D in Ghana and its likely ongoing escalation, it is important to consider the implementation of practical, low-cost, community-based interventions as part of national efforts to reduce the burden of T2D and overall attainment of the United Nations Sustainable Development Goal of reducing premature mortality from NCDs by 2030.

## Addressing Type-2 Diabetes in Ghana

From a community perspective, strategies for reducing the risk of T2D and its consequences commonly involve targeting behavioural risk factors and facilitating engagement with primary healthcare services. Behavioural risk factors include a diet high in processed food and sugars, physical

inactivity, smoking, and excessive alcohol consumption, with increased risk amongst those with a family history of T2D and being aged over 40 (Asamoah-Boaheng et al., 2019). There is strong impetus for education-based community interventions to increase individuals' competency and motivation to engage in healthy behaviours for T2D prevention and control. This is relevant to the Ghanaian context, as many studies have observed inadequate knowledge of T2D and preventative behaviours amongst those with and without T2D, particularly around the specifics of healthy dietary practices (Afaya et al., 2020; Doherty et al., 2014). Additionally, the risk of T2D and associated complications are significantly increased by limited early engagement with primary-level healthcare (de Graft Aikins, 2014; Atun et al., 2017). While education is clearly important, individual education fails to address the underlying causes of disease and barriers to care and wellbeing. Interventions focusing on empowering communities to address T2D and context specific barriers to care are likely to be more effective for mitigating the burden of T2D within resource-constrained contexts. Previous research has suggested that interventions that involve community empowerment have been effective in improving T2D outcomes and patient care (Mogueo et al., 2020).

## Participatory Learning and Action to Address Type-2 Diabetes

A recent scoping review conducted by this research group on participatory research projects addressing NCDs in Ghana revealed different levels of participation across the projects (Kretchy et al., 2022). However, most projects fell into the 'low' category, in terms of participation, at all stages in the intervention process (diagnosis, development, implementation and evaluation). There is clearly a lack of participatory approaches to addressing NCDs in this context. Participatory Learning and Action is one approach that has proved effective in addressing the health needs of communities in resource strained settings.

Participatory Learning and Action (PLA) is a community intervention inspired by the philosophy of Paulo Freire. Freire argued that the development of "critical consciousness" among marginalised groups would enable positive change (Freire 1993; Morrison et al., 2019). Critical consciousness means groups of people are able to apply critical thinking skills to discussions and solutions about their communities and conditions that affect them, which leads to taking action to improve their lives and communities (Freire, 1972). PLA has been systemised into a community group-based cycle of problem identification, planning solutions together, implementation of solutions and reflecting (Prost et al., 2013; Morrison et al., 2019), and has proven

to be highly effective in addressing maternal and neonatal health in LMICs (Prost et al., 2013). In rural Bangladesh it has been highly effective in reducing the prevalence and incidence of diabetes (Fottrell et al., 2019). In Bangladesh, when exploring the reasons that PLA was effective in tackling T2D, a detailed process evaluation postulated that through groups and the PLA cycle, both individuals and communities were enabled to recognise and implement strategies to address diabetes specific to their communities (Morrison et al., 2019). While not PLA directly, other LMIC countries have utilised a type of participatory peer led programmes to reduce the risk of Type 2 Diabetes in rural India (Mathews et al., 2017).

As a group, we were interested in whether PLA could be applied to address T2D in the urban Ghanaian context. However, we recognise that there are major contextual differences between a rural setting in Bangladesh and an urban one in Accra. Therefore, we did not expect to replicate the intervention, rather to draw on the principles and cycle of PLA to explore what a community-based PLA intervention would look like in this context. PLA aims to empower communities to address their own needs and centres the active involvement of the target community throughout the intervention (Chambers, 1997; Thomas, 2004). The principles of PLA include: the active participation of communities in the PLA cycle (problem identification, planning solutions, implementing solutions and reflection); valuing multiple perspectives; group learning; context specific intervention/materials; community ownership of strategies/activities; and collective action leading to change (Morrison et al., 2019; Napier & Simister, 2017; Appel et al., 2012).

## Aims

The aim of this paper is to reflect on the process of developing and piloting a PLA intervention to address T2D in urban Ghana. Specifically, it describes the process, challenges and learning. A formal evaluation of the pilot intervention is forthcoming and will be discussed in a later paper.

## Methods

### Context

This research was conducted as part of the “CARE: Diabetes in Ghana” project which seeks to understand and address the burden of T2D in a densely populated urban poor community – Ga Mashie - in Accra, Ghana. The CARE project was funded by the Medical Research Council (UK) running from 2020 to 2024. It is a partnership between the University of Ghana, University College London, University of York,

University of Melbourne and University of Greenwich. Working with the community, the CARE project aimed to: (1) define the burden, context, and community challenges around T2D in Ga Mashie and (2) empower Ga Mashie towards designing and implementing a community health intervention to address its key challenges around T2D (Lule et al., 2024; Baatiema et al., 2024a, 2024b).

Ga Mashie, where the project took place, has a population of approximately 80,000 and consists of two densely populated and poor neighbouring settlements: Jamestown and Ussher town. Ga Mashie is the oldest district in Accra and home of the original Ga settlers. It was once the economic centre of Ghana’s capital city, but recent decades have seen the community suffering from progressively reduced resources, threatening the population’s wellbeing (Wrigley-Asante & Mensah, 2017).

## Intervention Development and Implementation

Methods of adaptations were guided and based on a combination of the ADAPT guidance (Moore et al., 2021) and the Medical Research Council (MRC) Framework (Skivington et al., 2021). Both frameworks involve considering context, engaging stakeholders, adapting/developing/refining an intervention, implementation, and evaluation. In line with both frameworks, our pre-liminary work helped informed the first stage particularly and we worked closely with communities throughout. A formal evaluation will be reported elsewhere. PLA has four phases – Fig. 1 provides detail of what activities took place during each phases (the process of the intervention is described in greater detail in the results).

## Reporting on Learning and Reflections

The purpose of this paper is to report on the research team’s reflections on: (1) The process of developing and implementing a PLA intervention (i.e. what happened in practice during each of the first three phases), (2) The main challenges faced and how they were addressed and (3) Key lessons learned. As part of this, we also explored how closely we were able to follow the principles of PLA.

The results and conclusions reported in the paper were reached through an iterative process of reviewing relevant sources from the intervention development and evaluation phase, extracting and organising the information according to the areas of interest (process, challenges, lessons learned), reviewing as a team and agreeing by consensus. This is reported in detail below.

We reviewed several sources including:

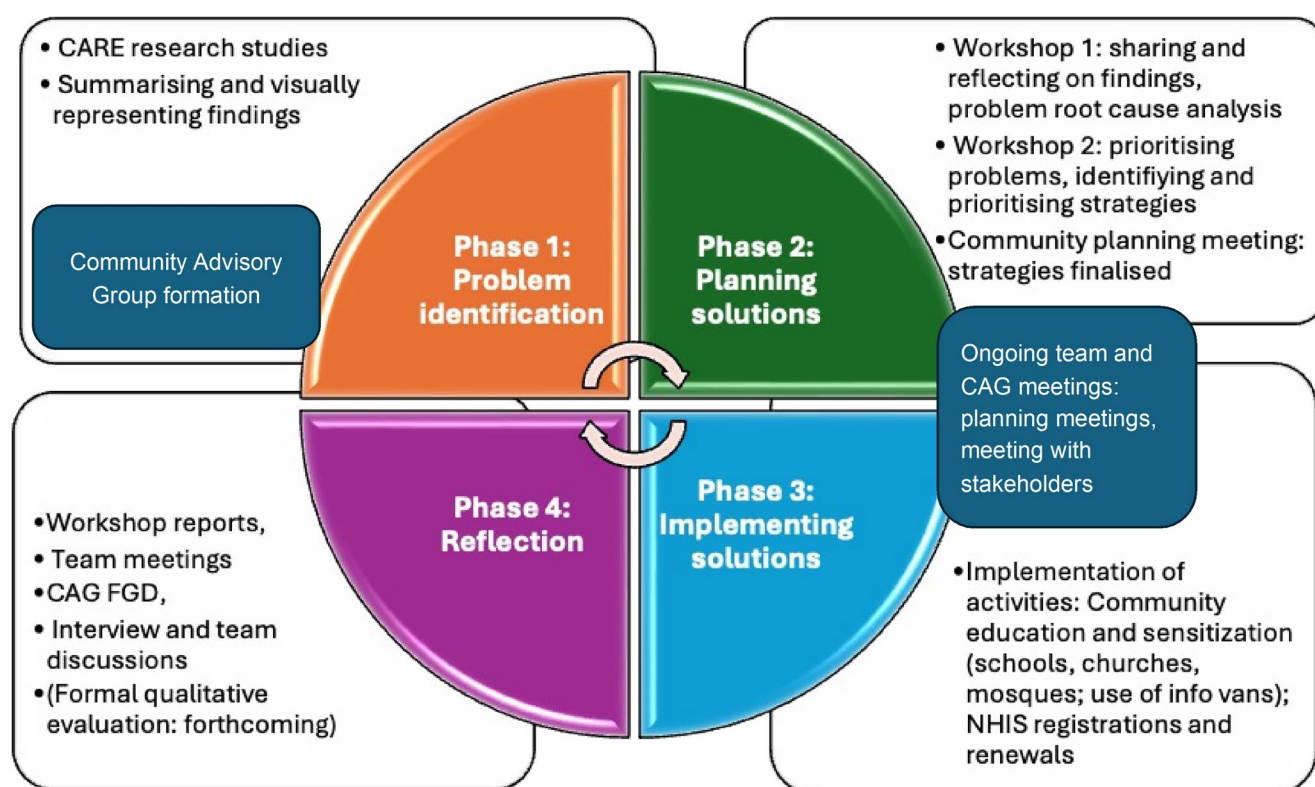


Fig. 1 PLA cycle

- Reports from workshops in phase 2 (the workshops were recorded and a detailed report of the discussions, activities and decisions were produced).
- Observation reports from the strategies implemented in phase 3. Strategies refer to the solutions developed as part of phase 2 to address problems. For each activity that was part of the strategies a pre-developed observation sheet was completed by a researcher present. Categories to be completed included: attendance, interaction, activities completed, discussion points, challenges observed).
- A transcript of the focus group discussion with the Community Advisory Group (CAG), conducted during the evaluation (phase 4), to address questions about their experiences with the PLA intervention and its' principles.
- Detailed reflective notes from team members (EG, SA, VA-A) based on the themes of the PLA process, what worked well, lessons learned and PLA principles throughout the phases.
- Notes/minutes from regular team meetings (that occurred on average monthly throughout the development and implementation) during which time we discussed our findings and reflections.

Following a review of the above, PA and EG used a table to extract key points relating to each of the above three

areas. In March 2024 HMJ, PA and EG met for a one-day workshop and reviewed the table, notes and discussions and wrote a preliminary report. SA and VA-A subsequently reviewed the output which enabled the team to agree and compile an initial draft of the findings organised around the themes of process, challenges and lessons learned. Finally, we assessed levels of participation across the stages of the pilot PLA intervention (diagnosis, development, implementation and evaluation) using Pretty's participation typology as adapted by Snijder et al. (2015) following the same process we had in the review of participatory NCD interventions in Ghana (Kretchy et al., 2022). This is a 7-point scale from no participation (i.e. completely top-down approach from outside actors) to self-mobilisation (i.e. completely bottom-up approach from the community where the project is situated). Low participation was judged as scores 1–4 (no participation, passive participation, participation by information and participation by consultation) and high participation score 5–7 (functional participation, interactive participation, self-mobilisation). See **Supplementary File 1** for full definitions of each level. HMJ reviewed the criteria and our reflections assigning a score with justification for each phase - this was reviewed and decided through consensus with PA and EG initially and subsequently the rest of the team.

The findings were drafted and shared with the CARE team involved in the PLA intervention development and implementation who reviewed it before it was finalised.

### Trustworthiness: Bias and Reflexivity

To manage potential influence or naturally occurring biases, the research team held regular team meetings. During these meetings, we discussed any concerns, shared reflections and collaboratively determined next steps, allowing us to address any individual biases within the team. In addition to these meetings, we conducted a debrief after each workshop to reflect on observations and experiences that emerged during the sessions. These debriefs provided a space for the research team to discuss reflective and observational notes throughout each phase, enabling critical engagement with the implementation process and fostering reflexivity within the team. Within this paper we strive to be transparent, recognising our influence in the intervention and implementation process and reflect upon it in the results.

## Results

We present our reflections in four sections: the process (what we did – reported according to the first three PLA phases), considerations and challenges, lessons learned and levels of participation.

### The Process: What We Did

#### Phase 1: Understanding the Context (Problem Identification)

The findings from the different components of the CARE diabetes study were collated. They included: a community survey examining NCDs and risk factors and six qualitative studies aimed at generating a contextual understanding of T2D in Ga Mashie. The qualitative studies focused on community, care provider and policy perspectives to understand food markets, environmental influences, health services demand and supply and historical perspectives through a range of methodologies (focus group discussions, interviews, photovoice, document reviews and cognitive mapping). Here we provide a brief overview of the findings; more details of these studies are published elsewhere (Grijalva-Eternod, 2024; Amon et al., 2024; Baatiema et al., 2024a, 2024b) and in publications forthcoming.

Findings highlighted a high prevalence of T2D and other NCDs in Ga Mashie, above national estimates. Community members engaged in unhealthy behaviours (e.g. poor diet and lack of physical activity) despite some awareness of

associated risks. Unhealthy behaviours were perpetuated by environmental, social health care and information challenges, such as the limited availability of healthcare, readily available “fast” food and a lack of space. While some people reported having support from family members, others reported an absence of social, emotional and financial support around T2D. People reported stigma around diabetes, meaning they were often reluctant to share their diabetes status thereby limiting social support. Findings revealed a lack of access to reliable information about diabetes. There were significant delays in community members seeking and using formal healthcare services. Direct and indirect costs of these services were identified as a major challenge, often leading to further detriments to health and increased costs.

CARE study findings were condensed and a leaflet developed to illustrate the summarised findings (Fig. 2) and shared as part of the first workshop (described below). The problems identified by the CARE team resonated with workshop participants.

During phase 1 the CAG was formed. It was felt imperative (and in line with PLA principles) to have members of the community alongside the research team to share, plan and implement the intervention. CAG members were purposively selected and identified based on having a reputation of being trustworthy and having some kind of leadership position. A gender balance and representation from different sectors of the community was ensured (i.e. different religions and age groups). Through informal discussions, we observed that these individuals were natural leaders within their sectors of the community and well suited to be representatives of the community.

Twenty-five men and women were selected and included: chiefs, religious leaders, market queens<sup>1</sup> and fish mongers. They were selected to represent and advocate on behalf of the Ga Mashie community, their roles included: contributing to the co-design of strategies and action plan for their implementation; advising on relevant and emerging contextual issues during strategy planning and implementation; mobilising community members to attend public events related to the intervention; advising on appropriate avenues for and playing leading roles in the implementation of the pilot activities (e.g., mobilisation, facilitation, coordination etc.); and leading on any plans for sustainability after intervention implementation. Meetings with the CAG and research team were held regularly during the intervention period. This included an initial meeting where a chairperson was selected to facilitate the meetings, and terms of reference stipulating roles, responsibilities and frequency of meetings were agreed.

<sup>1</sup> Senior respectable women in the community that manage market-based trading of goods.

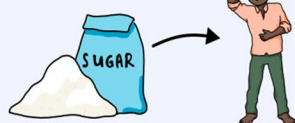


## CARE Diabetes: Research Findings

University of Ghana, University College London, University of York, University of Melbourne & University of Greenwich

### What is type 2 diabetes?

Type 2 diabetes, often called 'sugar disease', means the body has **trouble breaking down sugar into energy**, causing **sugar levels in the blood to become too high**.



### How common are lifestyle diseases in Ga-Mashie?



Nearly **1 in 10** people have **diabetes**

Nearly **half** of people have **high blood pressure**



More than **1 in 3** people are **overweight**

Nearly **2 out of 3** people have **at least one of these conditions**



### What can put you at risk for diabetes?



Eating foods with high sugar and fat



Being overweight



Alcohol & smoking



Not getting enough physical activity



Not going to the hospital or clinic early enough



Being aged 45 or older

### What do people say about diabetes in Ga-Mashie?

#### People use many different types of healthcare



"There are others who get worse when they mix traditional medicine with hospital medicine."

"I trust the medicine from the hospital because that works for me better than traditional medicine."

#### A healthy diet means food prepared at home

"You have to cook your own foods, as the street food isn't food for your health."



"[People] find it difficult to cook in their home so they buy food outside."

#### Many people are aware of diabetes and how to manage it



"It is called sugar disease. I know we get it through the intake of sugary foods and alcohol. We have to exercise and check our diet."

### Challenges around diabetes in Ga-Mashie

#### Behaviour challenges



"Males do not like visiting health facilities. [They] visit health facilities only when their health is in a worse state."

We turn deaf ears to advice. We are told not to eat certain things, but we eat them and say, "whatever can happen should happen"



#### Healthcare challenges



"Treatment of diabetes requires a lot of money. ... Getting health care is now dependent on the amount of money you have."

"We travel long distances to seek medical care."



"[People are] prescribed some medicines at the hospital but won't be able to purchase them."

#### Community challenges



"[People] will say all manner of things, such as this sickness kills, to scare you. So, because of these statements, when you have the sickness, you don't want to let people know."

"Instead of us being supportive to victims of ailments, we tend to stigmatize and discriminate against them."



"There is no space for physical exercises in this community."

#### Information challenges



Trustworthy, but hard to access



Easy to access, but not trustworthy

### What can help Ga-Mashie tackle diabetes?



Building on the knowledge people have about diabetes

Using technology like cellphones to connect to services and information



Strengthening community resources for earlier screening and treatment.

Bringing trusted health information and services into the community through the 'Network of Practice' approach



If you have any questions or want more information, please contact Dr Daniel Arhinful on 024 493 2139.

◀ **Fig. 2** Leaflet depicting findings from CARE

## Phase 2: Prioritising Problems and Planning Strategies (Planning Solutions)

Community workshops were the main means of wider community engagement to prioritise problems and determine strategies to address problems. The objectives of the workshops were to disseminate CARE study findings to the community; discuss problems emerging from the findings; share principles of PLA and evidence from other places; prioritise problems and identify root causes; identify possible strategies to address problems and prioritise strategies to be implemented. Table 1 describes the workshops' objectives and activities. Below we discuss the participants, implementation, and outputs from the workshops.

**Participants:** Ga Mashie community members were invited to attend the workshops, and included: lay community members with and without T2D, opinion leaders, healthcare workers, local policy makers and health managers. It was decided not to invite high-level policymakers as there was concern that they would dominate the discussion. Approximately 60 community members were invited to attend the two, of which 35 community members representing varied community roles participated in each workshop.

**Implementation of Workshops:** The workshops took place one week apart (June–July 2023) at a respected community-based organisation in Ga Mashie. The space was familiar and accessible to community members. Each workshop lasted a day (9am–4pm) and included breaks and food. The workshops included presentations, smaller break-out group discussions and whole group discussions. Presentations were kept short (around 15 min), with more time for smaller group discussions (approximately 90 min). Research team members who were fluent in Ga facilitated discussions and smaller group sessions. Although the information materials were provided in English, all discussions were conducted in Ga (and presentations translated into Ga). We strived to ensure the workshops were highly interactive. The presentations were kept brief and included visuals. Attendees were encouraged to ask questions and share reflections during presentations. Break-out groups enabled more in-depth discussions, and facilitators encouraged everyone to participate. Following these sessions, a collective review allowed groups to share their insights, promoting broader reflection among all attendees. Topic guides were used to guide the smaller group discussions. Aligning with the theme of empowering people to address their health needs and responding to the need for greater education and screening, free screening for hypertension and T2D risk was offered by volunteer health workers during the workshops, with brief counselling and sign-posting available for individuals

identified with elevated risk. T2D education was woven into presentations, covering risk factors and management, and a local medical doctor and dietitian discussed the nature of T2D and the role of diet.

Overall, the research team and CAG members observed that participants greatly contributed to discussions and demonstrated high enthusiasm for the PLA pilot intervention. There was broad consensus on the problems identified in the community and strategies that could address them.

**Workshop outputs: prioritised problems and strategies:** Overall, community members accepted the findings presented by the study team as a true reflection of T2D and other NCDs' situation in Ga Mashie. Facilitated by the research team, they further analysed the problems and root causes. The community-prioritised problems fell under seven broad and inter-related categories, which were: healthcare utilisation, care provision, lifestyle/behaviour, psychosocial, health information, environmental and costs. A summary of the problems identified and prioritised are in Table 2.

A range of strategies were suggested to address the problems including: raising public awareness, training for health workers and food vendors, service provision, and supporting people with costs. Table 2 also shows the suggested strategies for each problem area. It was agreed that the main focus should be on public education and providing support to register and renew community members' National Health Insurance Scheme (NHIS) subscriptions. Shortlisted strategies such as training food vendors and health workers, further subsidies and service provision were not feasible in the time period and with available resources.

The CAG was pivotal to the identification of the intervention strategies. CAG members suggested that health education at churches and commonly shared social spaces could be an effective and accessible method of educating members. They contacted schools, churches and mosques to organise events. The CAG and the research team also worked with local healthcare providers and government agencies, who were involved in the delivery of the strategies.

## Phase 3: Implementation of Strategies (Implementing Solutions)

The finalised strategies were: raising public awareness sessions via churches, mosques, schools and information vans, and community support in NHIS subscription and renewal. The objectives of the public education strategies were to increase knowledge and awareness of T2D prevention and management in the community and encourage behaviour change related to care-seeking, diet and exercise at a community level. Addressing the challenges of health care access and costs of care, the objective of the support with NHIS renewal and subscription was to minimise financial

**Table 1** Objectives and activities of the community workshops

| Workshop | Objectives                                                                                                                                                    | Content                                                                                                                                                                                                                                                                | Other activities                                                                                                          |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| One      | 1. Share, review and reflect on CARE findings<br>2. Share principles of PLA and evidence from other places<br>3. Prioritise problems and identify root causes | Presentation of CARE findings<br>Presentation of principles of PLA<br>Group reflections on presentations<br>Group discussions: problem analysis (prioritisation and root causes of problems)<br>Feedback and discussion on group discussions<br>Wrap-up and next steps | Distribution of leaflet<br>Free health screening<br>Education on diabetes management and risk factors<br>Food/snack/lunch |
| Two      | 1. Brainstorm strategies to address prioritised problems<br>2. Agree on strategies for the pilot intervention<br>3. Plan the pilot intervention               | Presentation of problem analysis synthesis<br>Group discussions: activities/strategies to address problems<br>Plenary discussion: prioritisation of strategies<br>Discussion on plans for pilot intervention                                                           | Free health screening<br>Food/snack/lunch                                                                                 |

**Table 2** Prioritised problem areas and suggested response strategies

| Problem area           | Problem focus                                                                                                                                                        | Intervention strategy                                                                                                                                                               |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Healthcare utilisation | Medical/healthcare pluralism<br>Non-adherence to treatment (medication & appointment)<br>Delayed healthcare seeking                                                  | Public Education<br>Education groups<br>Patient care training for formal healthcare providers                                                                                       |
| Care provision         | Unreliable and limited health insurance cover<br>Negative health provider attitude<br>Lack of awareness of National Health Insurance Scheme (NHIS) diabetes coverage | Public Education<br>Education groups<br>Patient care training for formal healthcare providers                                                                                       |
| Lifestyle/behaviour    | Dietary practices and food preparation<br>Excessive alcohol intake<br>Physical inactivity                                                                            | Public education<br>Education groups<br>Health-focused social clubs<br>Introduction to physical activity<br>School-based preventative education intervention                        |
| Psychosocial           | Stigma<br>Inadequate social support<br>Negative sociocultural norms (i.e. seeking help is a sign of weakness)                                                        | Public education (sensitization on correct norms relative to T2D)                                                                                                                   |
| Health information     | Health information multiplicity (health professionals vs. TV, radio, herbalist, priest, etc.)<br>Misinformation and inconsistent information                         | Public education (sources of accurate health information)                                                                                                                           |
| Environmental          | Lack of physical space<br>Limited availability of healthy street food                                                                                                | Public education (dietary practices/physical activity and benefits)<br>Training for food vendors on preparation of healthy food                                                     |
| Costs                  | High costs of treatment<br>Healthy food is often more expensive                                                                                                      | Advocacy for free T2D care<br>Support people with diabetes to renew NHIS<br>Public education<br>Subsidy for purchase of glucometer<br>Public education<br>Training for food vendors |

barriers in accessing T2D and other NCD care, educate participants of the value of the NHIS, and improve trust and confidence in the scheme. The process of the implementation of these strategies is described briefly below.

*Education Via Institutions (churches, mosques, schools):* Institutions were initially contacted to obtain their consent and subsequently, several meetings were set up with stakeholders (health organisations, headteachers, religious leaders) to liaise on logistics of the strategy and the development of the education materials. The Municipal Health Director was involved and supportive, which was considered key for sustainability of such a pilot. Education sessions were

held at three schools, five churches and one mosque. Members of the research team, CAG members and public health nurses delivered the sessions. The sessions involved giving educational talks on T2D and the risk factors, answering questions and providing health information (through leaflets). For adults, there was screening for blood pressure and blood glucose and signposting to health facilities. In schools between 180 and 250 young people attended per school, though they were separated into 2–3 groups for the education sessions. For churches the sessions were often part of the service and congregations ranged from 80 to 200 members. There were 68 participants at the mosque.



*Education via information vans*<sup>2</sup>: this means of public education was agreed to be a contextually appropriate means of disseminating information. Contact was made with van operators, local information centres, Ussher polyclinic<sup>3</sup> and the National Commission for Civic Education who helped support and plan the strategy. A total of 6 sessions took place over 5 days in Ussher town and James town November–December 2023 at different times. The vans with a PA (public announcement) system repeated educational messages about NCDs and diabetes as they drove through strategically planned routes. Accompanying the vans were members of the research team, 1–3 nurses and an education commissioner. The vans would stop frequently (up to 9 times per session) for approximately 15 min, during which time people would approach the team and could ask questions, discuss any concerns and be signposted to services. Education leaflets were also distributed. Approximately 40–60 people interacted directly with the team per session and 80–90 leaflets were distributed per event. It was observed that people appeared interested and keen to interact with the team.

*National Health Insurance Scheme (NHIS) Renewal and Subscription*: Yearly subscription to Ghana's NHIS is relatively low cost (2–10 USD)<sup>4</sup> and allows access to a number of medications (including for diabetes) and services, with children and elderly people exempted from the fee. However, an identified problem (in phases 1 and 2) was that many people were not registered, or their registrations had expired. It was agreed that supporting people to register would enable greater access to available services. Prior to the strategy (in December 2023) an information van announced registration events and locations. CAG members also let community members know about the scheme. When planning for the event, a local Assemblyman<sup>5</sup> agreed to facilitate the registration processes by liaising with the NHIS office for free insurance registration under the social protection benefit of the scheme. This enabled free NHIS registrations for community members. Over one day (8–4pm) events were held in parallel at three community centres. Members of the CARE research team, 3 nurses from Ussher hospital, an education officer and 16 NHIS workers attended the sessions. NHIS workers in turn sat with and assisted people to renew or register with NHIS and answered any questions. Additionally, a nurse screened participants for blood pressure (BP) and blood glucose and educational leaflets were handed out. The events were well attended; 506 community members

were newly registered and 556 had their NHIS subscriptions renewed.

## Considerations and Challenges

A number of considerations and challenges were identified by the research team, which are described below.

### Logistical Challenges and Time Constraints

Limited time was allocated for the development and implementation of the intervention (April–December 2023), with community workshops only beginning in late June. There were some delays and disruptions in finalising the details of the strategies and implementing them. Over this relatively short time frame, the research team were responsible for coordinating activities with stakeholders at the research, community, healthcare and governance levels. These included obtaining permission from ruling bodies (schools, local health authority etc.) to carry out the intervention pilot and request their assistance. Equally, the research team made strategic decisions to complement activities with other concurrent community events. This included avoiding holding events at the same time as funerals or a local festival in August and aligning the events with Ghana's national NCD Month<sup>6</sup> to facilitate engagement. While the research team worked effectively to manage these challenges, they resulted in unavoidable delays that constrained the time for the implementation of phase 3 of the intervention.

### Considerations Around Activity Sustainability

While the CARE research team were clear that the intervention was a pilot, community members felt that sustainability of activities and strategies beyond the timeframe of the pilot was important. A key focus of PLA is empowering the community with ownership and agency towards addressing T2D in their community. This was actively fostered through ongoing community engagement throughout the design process and by formalising support roles through the CAG. The greatest asset to the sustainability of the intervention activities is the CAG. However, despite the enthusiasm exhibited by the CAG for the continuation of the implementing strategies and similar activities, this requires technical and financial support. The research team and healthcare providers played a necessary role (logistically and through funds) in the coordination of activities, which raises the challenge of how to support activities beyond their active involvement. Similarly, local health officials, staff of the Ussher Clinic and the Municipal Director of Health Services played a very

<sup>2</sup> Small vehicles, providing information through a loudspeaker.

<sup>3</sup> Polyclinics are primary care community clinics.

<sup>4</sup> The average monthly household income in Ga Mashie is 78.83 USD.

<sup>5</sup> A political representative.

<sup>6</sup> A government held initiative to create more awareness around NCDs.

important role in the pilot. If more community members were to assume roles in a similar intervention, key questions arise around the support and training required for them to feasibly co-ordinate education interventions. One must also explore the capacity for researchers and healthcare providers to take on longer-term roles in the monitoring or coordination of activities until the community feel proficient in doing so independently.

### Shifting Responsibility onto Community Members

There arises a broader ethical concern about how much responsibility the community can be tasked with in relation to addressing their needs around T2D. While PLA strives to empower communities to act against challenges relating to health, individuals cannot and should not be forced to supplement systemic shortcomings in their healthcare and social environment. As such, when considering the ongoing role of the community in sustaining intervention activities, one must evaluate the support and reimbursement that would ensure community members also benefit by adopting these roles. This was particularly pertinent considering the significant demands placed on CAG members. Their contribution was unpaid (with only transport and food costs being covered). The majority of CAG members were in full-time employment, so difficulties often arose in managing time. If the process were to be replicated and/or activities to be continued the ethical and logistical reasoning must be revisited.

### The (over) Influence of the Research Team in the Strategy Development Process

While we believe that across the PLA intervention community members were actively involved in problem definition, solution ideation and implementation, we are mindful of the level of influence we as a research group had in the strategy development. Specifically, insights of researchers necessarily shaped the information presented to the community, the emphasis within the problem context, and solution directions. This may have diluted and swayed the input from members of the community, especially when considering the high level of respect attributed to the researchers by the community. Furthermore, the involvement of researchers was essential to the organisation of various strategy activities (particularly given the limited time frame) meaning that it is likely community members did not adopt complete ownership over these. Reflecting on this within the PLA philosophy, it shows the importance of recognising the limits of community participation in adjusting how people participate and collaborate to support the goals of

the strategy development processes. Specifically, in this case this meant establishing a bi-directional relationship between the researchers and the community where both parties could collaboratively participate in developing appropriate strategies to address the needs of the community. However, we recognise the (over) influence we as a research team had in guiding the process.

### Lessons Learned

As a research team our prioritised learnings from the intervention development and implementation are as follows:

#### PLA Appears to be Popular

PLA appeared to be effective for eliciting community engagement and designing community strategies within the context of Ga Mashie. Community members cited positive experiences across the workshops, expressing a desire to play an active role in addressing T2D within their community. The PLA cycle enabled the community to prioritise health threats and build enthusiasm for collaborative solutions. Specifically, participants appreciated the participatory approach adopted to find strategies to solve the issues raised. This was reflected in the high degree of engagement by those that attended the workshops, with the majority of attendees actively sharing ideas during the collective and break-out discussions and the consistency of attendance across both meetings. Furthermore, engagement by attendees was balanced and co-operative, with attendees listening to the views shared by others and no individuals or groups dominating the discussion. This highlights that PLA provides an effective approach for engaging communities in urban Ghana towards the design and implementation of health-promoting strategies.

Linked to high engagement, PLA principles also emerged as effective in supporting the goals of strategy development. The emphasis on positioning community members as knowledge experts along all steps of the design process allowed for in-depth exploration of the challenges the community faced and for these challenges to be distilled to their root causes as experienced by the community. Furthermore, leveraging the implicit knowledge of community members enabled strategies to be developed that were familiar and appropriate to the community, ensuring high uptake and trust. This attests to the value of actively engaging target beneficiaries of community interventions to ensure that key challenges are addressed in an appropriate way.

### **Success of the Process was Highly Contingent on the Relationship Between the Research Team and the Community**

The use of appropriate researchers for the context was integral to the success of the intervention development and implementation. In particular, local researchers were responsible for organising and co-ordinating the various activities throughout the whole PLA intervention. These researchers were highly respected and trusted by the community because of their degree of education and familiarity with the social context of the community. This enabled informed decisions to be made about the logistics of organising various activities to ensure more effective attendance and reach across the community. It also supported effective engagement by attendees as researchers were able to facilitate discussions in local languages and create a more comfortable and familiar social environment at meetings and events.

### **Engagement was Biased Towards Community Members with Greater Social Status**

Reflecting on community engagement and participation, it is crucial to explore the degree to which the community were represented throughout the process. A strategic decision was made to target members of the community who occupied positions of power/influence to represent the community within the CAG and to a lesser extent the community workshops. These individuals were targeted as they have greater influence, trust, respect and social capital in local institutions that renders them more empowered to implement and sustain activities within the community. Furthermore, considering that not all members of the community could be engaged (given the limited time), emphasis was placed on individuals who were trusted leaders in the community and who were familiar with representing the needs and views of their broader community. This decision proved to be effective, especially in the constitution of the CAG, as individuals were able to leverage their understanding and influence in the community to support intervention activities. While CAG members were selected to represent community members, the approach also meant that those with less influence were less involved in defining their problems and solutions. It is always difficult to ensure equal representation of voices, and while we tried to ensure leaders represented different groups it is plausible some groups were less represented than others. Reflecting on this learning, were we to repeat the process, we would prioritise allocating more time to ensure the active participation of community members from all strata of the community within each phase of the PLA cycle. This may be achieved by purposively identifying

members from more marginalised sectors of the community to engage with and if appropriate we would meet with groups from different strata at different times to maximise their involvement.

### **Awareness was a Key Focus Area of the Prioritised Strategies**

There was a strong propensity towards educational awareness-based strategies amongst the community. It was evident in the workshops and meetings that community members attributed high value to possessing reliable knowledge on T2D, with a notion that empowerment meant being sufficiently informed to make effective decisions around diet, physical activity, and health-seeking. This may have been a consequence of the structure of community engagement workshops, where talks included education on T2D by health professionals, and the short timeframe for the implementation of the strategies. This may have influenced the community towards adoption of a similar strategy by affirming its feasibility, acceptability, and value. However, educational strategies are far more actionable, particularly given the short timeframe, than wider environmental strategies. Given that all the strategies focused on education, future consideration for such an intervention, with a longer timeframe, would need more emphasis on complementary social strategies for a more holistic outlook on the wider social and environmental determinants of health.

Aligned with the emphasis on education, community members suggested a diversity of education approaches that would ensure the targets, context, and nature of education were more exhaustive. Recognising the importance of collectively empowering the whole community through education, participants stressed the need to cater education to the needs of various groups in the community, including children with low immediate risk of T2D as well as older adults at risk of or diagnosed with T2D. To achieve this, a range of education strategies were piloted across schools, religious gatherings of different denominations, and public spaces. Due to the short time-frame and because the intervention was a pilot it meant the strategies were one-off events, with no opportunities to explore ongoing uptake and engagement – however the events did appear popular with high levels of engagement.

### **Levels of Participation**

Drawing on Petty's typology of participation as adapted by Snijder et al. (2015) we assessed levels of participation at different stages in the development and adaptation of the PLA pilot intervention (Table 3). We found levels of participation to be functional (level 5) for phase 1 (Understanding

**Table 3** Levels of participation by PLA stage

| Stage          |                               | Score                             | Explanation                                                                                                                    |
|----------------|-------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Diagnosis      | PLA 1: Problem identification | 5 – functional participation      | ‘Outsiders’ (research team) had predetermined goals; the community assisted in defining the issues within the goals.           |
| Development    | PLA 2: Planning solutions     | 6 – interactive participation     | ‘Outsiders’ and community work together to develop the project and address the agreed upon goals.                              |
| Implementation | PLA 3: Implementing solutions | 6 – interactive participation     | ‘Outsiders’ and community work together to implement the project. Resources from within the community used.                    |
| Evaluation     | PLA 4: Reflection             | 4 – participation by consultation | ‘Outsiders’ define the evaluation process; community provide the information and make suggestions for improvement and feedback |

Context and Identifying Problems) as we had pre-determined goals where we (the research team) researched and defined the problem – however community members did reflect on and assisted with defining the goals. Development and implementation (phases 2 and 3) was deemed to be interactive participation (level 6), whereby outsiders and the community work together to address goals. The intervention was certainly participative, and there was a sense of partnership between community members and the researchers. The evaluation, however, was participation by consultation (level 4) as this was led and designed by the research team. Petty’s typology was useful in examining how participatory the intervention was and areas for potential improvement.

## Discussion

Using PLA to address T2D in urban Ghana proved feasible and popular with both researchers and community members. There were several challenges identified including time constraints, logistical difficulties, the business and responsibilities of community members, the research team primarily defining the problem and the overall sustainability of the activities and project. Lessons learned during the process included the importance of having an established relationship with communities, having a bi-directional relationship between community members and researchers, and influential members of the community being the main participants in planning and deciding on strategies to address T2D. The strategies were a series of one-off events, with a focus on education. While the events were held at different locations between November 2023 and December 2023, we only ran the education session one time within each church/mosque, school and the information van only operated the route on one day. Need was shaped and driven by community members who attended the workshops, which were popular and interactive. When comparing other community based NCD interventions in Ghana (Kretchy et al., 2022), programmes focusing on prevention among the general population are rare - the series of one-off education events as part of a participatory diabetes intervention appears unique to the CARE project. Given the lack of knowledge around T2D and the

risk factors in Ghana (Afaya et al., 2020; Doherty et al., 2014) we concur that education is very important. Having local health workers (volunteers, public health nurses) and NHIS workers support the intervention and delivery of the strategies worked well logistically and likely increased the acceptability of the intervention from the perspective of those receiving it, as did having the CAG involved throughout the whole process. The effect of the multiple stakeholders (CAG, research team, health workers, NHIS workers etc.) involved in the intervention process on the results and intervention delivery was evaluated as part of the formal evaluation of the intervention (publication forthcoming). Being able to reach a range of people in familiar spaces and encouraging interaction is crucial. When reflecting on the level of participation of the PLA pilot we assessed it as “interactive” or 6 out of 7 according to Petty’s adapted participation ladder (Snijder et al., 2015; Kretchy et al., 2022) for both development and implementation, representing a true partnership between the research team and community members. This is encouraging and rare in the context of NCD interventions in Ghana (Kretchy et al., 2022); being able to reach a level 7 of participation or full community self-mobilisation would be unrealistic given the timeframe or the nature of the project (i.e. being designed from the outset by university collaborators). However, phase 1 (development) and phase 4 (evaluation) of the process were less participatory. Furthermore, the assessment used (Petty’s adapted participation ladder) lacks some nuance in defining “community”. As reflected upon, “community” participation in this project was biased towards those in prominent positions. Furthermore, we do not view the CARE research team as complete “outsiders” (as described in Petty’s ladder) – several members have been working within the community for several years.

The PLA intervention in Ga Mashie, Ghana was very different to PLA implemented in rural Bangladesh, which followed a group-based model, and strategies implemented were dependent on village and included activities such as screening, education, exercise groups, gardening and income generation (Morrison et al., 2019; Fottrell et al., 2019). Being a pilot, time was very limited for this study, furthermore the context was very different. Nevertheless we



did strive to abide by the principles of PLA which include following a PLA cycle with communities actively participating, valuing multiple perspectives, group learning, context specific intervention/materials, community ownership of activities and collective action leading to change (Morrison et al., 2019; Napier & Simister, 2017; Appel et al., 2012). PLA is an effective approach for ensuring that strategies are contextually relevant. Our findings underscored the importance of this, a point similarly observed by Cately et al. (2020), who, although not employing PLA, conducted a participatory study adapting a diabetes prevention program for a LMIC in South Africa. Their study likewise found that participants considered the programme appropriate and well-suited to their needs. This highlights the critical importance of cultural relevance and contextual adaptation when implementing interventions in resources limited and culturally different settings.

As described above there was active participation, from at least certain sectors of the community, at all stages in the PLA cycle. While multiple perspectives were valued, it is important to consider how “lay” people could be more involved in the design and implementation of the intervention and its resulting strategies. In a manner comparable to our own research, Dowhaniuk et al. (2021) incorporated an advisory board in their participatory research to provide community representation and strategic guidance for their project exploring alcohol disorders in Uganda’s Gulu district. Consistent with our findings, they emphasised the value of a bottom-up, community based methodology, highlighting that collaboration with local communities can more effectively identify and address and priorities issues.

Community ownership is difficult to judge; however, community members reported valuing the intervention and were keen for it to continue. Long-term action and collective change would need a longer process, and it would be important to address some of the underlying determinants of disease. While some of these determinants were acknowledged in phase 1 and 2 (space and food environments for example) they were not addressed as part of the strategies which primarily focused on education. Knowledge of diabetes and its drivers, while certainly low in the context, was felt to be an important first step. However, should a similar process in this or a similar context take place over a more sustained period it is likely that some of the wider determinants would be addressed, which would building on knowledge gained.

## Strengths and Limitations

The strength of this paper is that it gives a detailed and thoughtful account of working on a community-based intervention using PLA. Not being a formal evaluation gave us

the freedom to draw on our experiences and as a team report on practical challenges and experiences which may provide learnings to other researchers and community groups considering applying PLA or other participatory interventions in similar settings.

We acknowledge several limitations. First, as this paper reflects on our own work, it is impossible to be completely objective and we fully acknowledge our interests. However, we did attempt to be self-critical and transparent about our roles. We believe it would be useful to share and discuss our reflections from this paper with community members in Ga Mashie and to report on their feedback. Unfortunately, we were unable to this within the lifespan of the project.

## Conclusion

This paper reflects on the process of developing and piloting a community-based PLA intervention to address T2D in an urban Ghana. PLA appears to be a promising approach to addressing T2D in this context. It was clear during this pilot that people were eager to engage with the intervention and work closely with researchers to address problems in their communities. Lessons learned provide insight into how PLA can be implemented in practice, and the importance of working closely with communities. Future research should explore the longer-term implementation and impact of PLA, as well as investing in the empowerment of communities and stakeholders in Ghana to mitigate the burden of T2D (and other health issues) and contribute to better health outcomes and enhanced quality of life.

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**Author Contributions** All authors contributed to the study conception and design. DA, PA, SA, EG, VAA, AB, LB, LO, EF and HMJ contributed significantly to planning the pilot intervention and evaluation, as well as reflecting on the progress. SA, VAA, DA and LB were involved in the implementation of the pilot intervention, with DA responsible for overseeing the logistics. Data collection for the evaluation was conducted by SA and VAA, reflective and meeting notes were written by SA, VAA, PA, EG and HMJ. Analysis was performed by PA, HMJ, EG and SA. The first draft of the manuscript was conducted by PA, with significant contributions from HMJ and EG. EF was the project Principal Investigator. All authors reviewed and commented on previous versions of the manuscript. All authors read and approved the final manuscript.

**Data Availability** The data that this report draws upon includes

research notes, meeting notes and reports. This is not currently publicly available - any requests for parts of the data should be made to the Principal Investigator (EF) and considered on a case by case basis.

## Declarations

**Competing Interests** The authors declare no competing interests.

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