Community engagement practices in Southern Africa: Review and thematic synthesis of studies done in Botswana, Zimbabwe and South Africa

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ABSTRACT

Community Engagement (CE) is intended to enhance the participation of community stakeholders in research. CE is usually mentioned in publications as researchers discuss how they carried out community entry, consent and retained study participants but the actual CE activities are not always well documented. This paper reviews CE strategies employed in health research in Botswana, South Africa and Zimbabwe with reference to the development of a CE strategy for a multi-centre study to be conducted in these countries. The search was conducted using JANE (Journal/Author Name Estimator), Google Scholar and PubMed with known institutions and researchers providing context-specific material. The final synthesis includes 35 publications, 2 reports and 2 abstracts. There is evidence of CE being practiced in health research and eight closely related CE strategies were revealed. We conclude that since communities are heterogeneous and unique, CE activities will not have similar results in different settings. Even though there was insufficient evidence to determine which CE strategy is most effective, the review provides sufficient information to develop a CE strategy for a multi-centre study using the various strategies and activities described.

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1. Introduction

Community Engagement (CE) is a broad concept that is nurtured in disciplines such as sociology, political science, cultural anthropology, organizational development, psychology and social work (Atlee et al., 2009; Minkler, 2005). The working definition of CE developed by the American Centers for Disease Control and Prevention (CDC) is; "The process of working collaboratively with and through groups of people affiliated by geographic proximity, special interest, or similar situations to address issues affecting the well-being of those people."(CTSA Consortium, 2011). Generally CE is used to describe activities that include information delivery, consultation, collaboration in decision-making, empowered action in informal groups or formal partnerships, health care delivery and promotion, HIV Aj IDS prevention and care, and community development (Boulanger et al., 2013; Nakibinge et al., 2009; Tindana et al., 2007).

The concept of CE is not unique to health research. It is used in programming and most community based projects (Michener et al., 2012). Involving the community in research, and the incorporation of a community's views and its collaborative involvement are considered to be a meaningful way to, amongst others, reduce the potential for exploitation (Pratt et al., 2015). Engaging a community in health research ensures participation of the community in the research process and enhances smooth implementation of studies. It demonstrates respect for, and empowerment of participant communities; and improves the relevance and quality of research (Marsh et al., 2008).

In the past two decades there has been an intense push by sponsors, activists, ethicists and researchers on the critical need to have CE as part of the requirements for conducting research (Tindana et al., 2011, 2007). CE is an important process that has helped to redress ethical concerns of fulfilling the three bioethics principles of respect for persons, beneficence and justice (Lavery et al., 2010; Marsh et al., 2008; Okello et al., 2013; Tindana et al., 2011). Having CE strategies ensures that researchers involve communities before, during and after the research is conducted (Nuffield Council on Bioethics, 2002).

While much effort has been made to develop guidelines and principles for CE there is no single document that is all encompassing and universal to assist researchers in implementing comprehensive community engagement (CIOMS, 2002; Department of Health SA, 2015; Lavery et al., 2013; MRCZ, 2011). However very specific guidance documents exist, such as the Good Participatory Practice (GPP) developed for CE in HIV/AIDS (UNAIDS, 2011), HIV Prevention Trials Network Ethics Guidance for Research (HPTN, 2009) and H3Africa Guidelines for Community Engagement exist (H3Africa-Consortium, 2014). These guidelines outline the basic ethical principles and basic requirements for CE in their respective disciplines. The guidelines set out the social complexities of stakeholder and community engagement and present guiding principles, and participatory practices and practical challenges related to the linkages and interactions formed between the researchers, participants and their stakeholders (Boulanger et al., 2013; H3Africa-Consortium, 2014; UNAIDS, 2011). The shortcoming of these guidelines is that they are very specific to their fields such as HIV/AIDS, TB and genetics research and no literature exists of them being used in other types of studies.

Published reviews of CE in health research (Hood et al., 2010; Pratt et al., 2015) have shown that community advisory board/groups (CAB/G) constitute the most popular mechanism for community engagement in research at a global scale. The CABs are usually used as a surrogate marker signifying that community engagement or consultation occurred. In studies conducted in Africa (Pratt et al., 2015) community advisory boards/groups (CABs/Gs) constitute the most popular mechanism for community engagement in research. As the name implies, the role of a CABs/Gs is advisory in nature, and is necessary for effective participation and honest governance. CABs act as the central venue for community participation in research (Buchanan et al., 2010). Other studies (Flicker et al., 2007; Marsh et al., 2008; Molyneux et al., 2005; Nyika et al., 2010) describe CE strategies that include, community consultations, development of research literacy within the surrounding community, building relationships with other organisations within the communities, policy makers and traditional leaders. These can start with simple ethnography and involve establishing long term relationships with the community for long duration studies (Angwenyi et al., 2013; Marsh et al., 2008; Okello et al., 2013). Even though these studies have demonstrated the vital role of CE in the success of community based research none have attempted to measure the effectiveness of any one or combination of the strategies. Some publications (Flicker et al., 2007; Israel et al., 1998; Nyika et al., 2010), show that CE has challenges and can sometimes lead to misuse of critical resources, selecting community-inappropriate strategies, increasing or introducing stigma by release of sensitive data without prior community consultation and lack of feedback when the research is completed; leaving communities feeling over researched, coerced, or manipulated.

This review was inspired by the need to develop a CE Strategy for a multicountry study being conducted in Botswana, South Africa, and Zimbabwe (MABISA—Malaria and Bilharzia in Southern Africa). It became apparent that even though guidance exists for the three countries, it is not explicit on the practical aspects of CE and what a successful CE strategy would entail (Department of Health SA, 2015; MRCZ, 2011; University of Botswana, 2004). Available guidelines from the sponsors of the study (IDRC, 2012; WHO, 2011) imply in parts that a community based study ought to have a CE strategy that includes consultation of local people but it is not clear what should be included. It is against this background that we reviewed health studies carried out in Botswana, South Africa and Zimbabwe and documented the common CE strategies employed. The purpose of the review was to determine the Community Engagement strategies that have been employed by health researchers in Botswana, South Africa and Zimbabwe and to what extent they have been effective? The review is useful as a reference for developing CE strategy for multicentre studies.

2. Methodology

This review was undertaken using the principles of thematic synthesis: line-by-line coding of study findings, developing descriptive themes and generating analytical themes (Thomas and
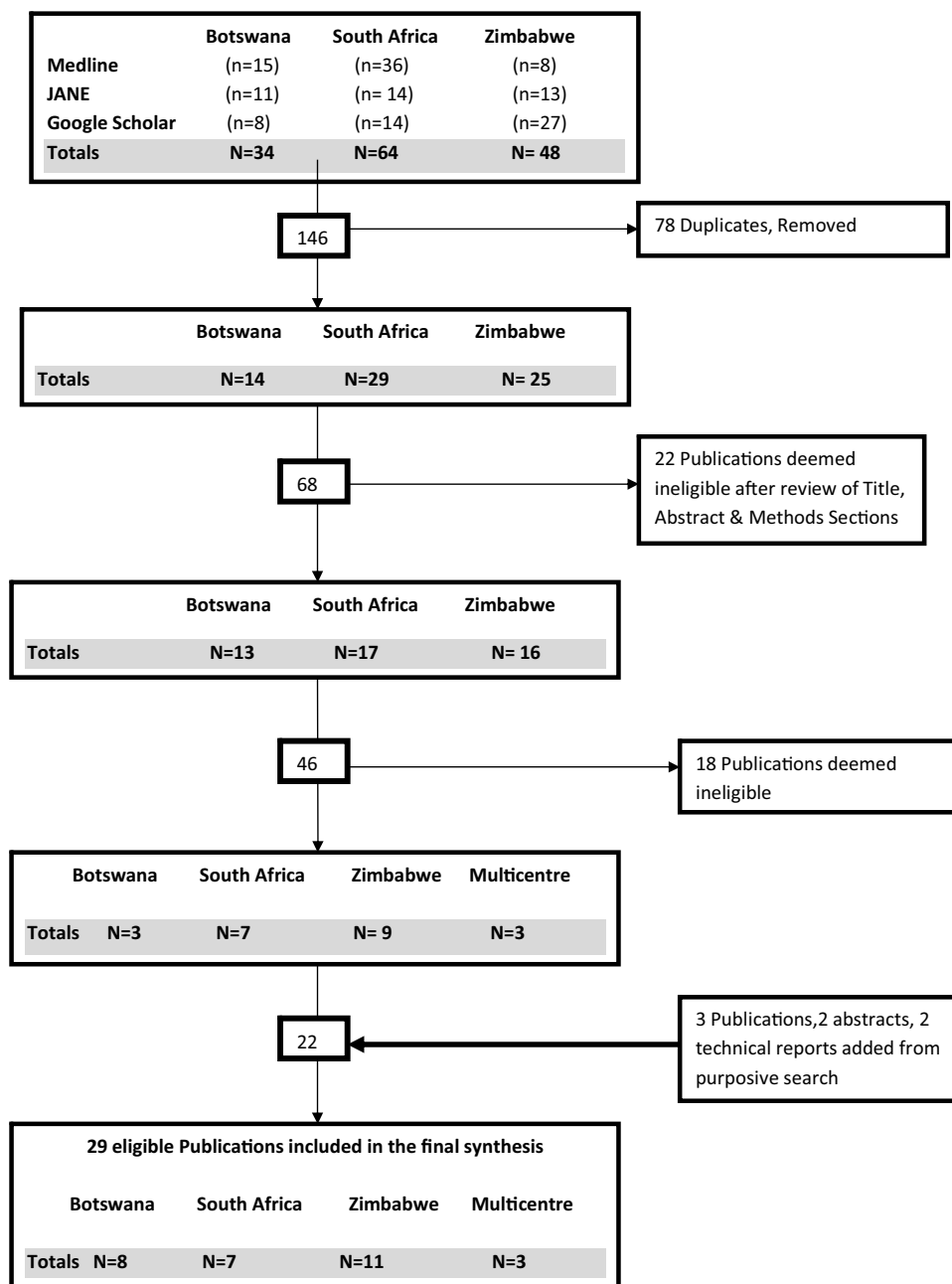
	Botswana	South Africa	Zimbabwe
Medline	(n=15)	(n=36)	(n=8)
JANE	(n=11)	(n= 14)	(n=13)
Google Scholar	(n=8)	(n=14)	(n=27)
Totals	**N=34**	**N=64**	**N= 48**

146 → 78 Duplicates, Removed

	Botswana	South Africa	Zimbabwe
Totals	**N=14**	**N=29**	**N= 25**

68 → 22 Publications deemed ineligible after review of Title, Abstract & Methods Sections

	Botswana	South Africa	Zimbabwe
Totals	**N=13**	**N=17**	**N= 16**

46 → 18 Publications deemed ineligible

	Botswana	South Africa	Zimbabwe	Multicentre
Totals	**N=3**	**N=7**	**N= 9**	**N=3**

22 ← 3 Publications, 2 abstracts, 2 technical reports added from purposive search

29 eligible Publications included in the final synthesis

	Botswana	South Africa	Zimbabwe	Multicentre
Totals	**N=8**	**N=7**	**N=11**	**N=3**

Fig. 1. PRISMA diagram.

Harden, 2008). Each of these overlapping stages is described in detail below.

2.1. Inclusion criteria and exclusion criteria

Studies were selected for review if they met the following criteria: published in peer-reviewed journals, were research studies, reported on the CE strategy used by the study, and were conducted in Botswana, South Africa and Zimbabwe. Only articles on CE in health research were included. Studies were excluded if they discussed CE for the purpose of health programming or practise. While these issues are also linked to health of the community, the focus was on the concept of researchers using CE as strategies to improve their relationship in the community for smooth research.

2.2. Search strategy

The systematic search was conducted using the following PubMed Medical Subject Headings (MeSH) terms: Community, Community Participation, Community Involvement, and Community Engagement. Thereafter, two searches were conducted in (Journal/Author Name Estimator) JANE, Google Scholar. Identified publications from each of the databases, including their abstracts and key words, were imported into an Endnote library.

After this systematic search for published studies, it became apparent that CE information was difficult to find particularly for Botswana and Zimbabwe and hence a deliberate purposive search was done on the websites of institutions that are known to carry out community research in the two countries. Researchers at those institutions were requested to send any published work, abstracts and technical reports that included evidence of CE.

Fig. 2. Number of studies reporting community involvement in steps of the research process.

Duplicates from both searches were identified and removed. Electronic copies of the final 146 publications were imported into NVivo 10 (QSR International, Melbourne, Australia).

2.3. Study selection: study appraisal and synthesis methods

The thematic synthesis of findings was carried out in three stages: line-by-line coding of study findings, developing descriptive themes and generating analytical themes (Thomas and Harden, 2008). In stage one: line-by-line coding of aspects that pertained to CE was independently conducted by three researchers on selected publications. Consistency of interpretation was checked manually by consensus method. In stage two descriptive themes were developed by researchers looking for similarities and differences between the codes through an iterative, inductive process. Stage three involved condensing the descriptive themes into analytical ones.

3. Results

The systematic search yielded 404 hits, which included abstracts and programme reports and duplicate articles. Initial screening yielded 146 articles, 78 were excluded based on the title and/or abstract review. A further 22 publications were removed after reviewing the title, abstract and methods sections resulting in 46 publications being fully examined. Eighteen Publications were ineligible as they did not describe new CE Strategies, resulting in 22 being used for the synthesis (Fig. 1). The purposive search produced 2 abstracts, 3 publications and 2 technical reports.

The number of times a CE activity was coded per publication was used to create a bar graph presented in Fig. 2. The activities are not mutually exclusive; more than one strategy could have been mentioned in one publication. Community involvement activities were the most mentioned CE strategies, (81.5%), followed by sensitisation & education (55.6%) and stakeholder partnership (55.6%). Community empowerment was mentioned by 51.9% of the studies, community advisory mechanisms by 44.4%, traditional leaders support by 44.4%, formative research by 40.7% and communication protocols by 29.6%. An indication of the outcome and/or challenges of the CE strategies was mentioned in 40.7% of the studies and 29.6% indicated that they had taken community perceptions into account.

3.1. Characteristics of included studies

Table 1 shows that 29 publications from the search included in the synthesis were conducted in Botswana, South Africa and Zimbabwe. Three of these were multi country studies. The earliest publication was published in 1993 and the most recent in 2014. Eleven publications were specifically dedicated to describing the community engagement strategies they employed. Most (14) of the studies [51.9%] focused on HIV/AIDS, 4 studies, [14.8%] on vector-borne diseases, 2 studies [7.4%] were on TB, 2 studies on climate change, and one each that focused on orphan-hood, cervical cancer, traditional medicine and HPV (Table 1). The longest studies were part of a network conducting research on microbicides and spanned over 10 years. The shortest studies were conducted over one month and were cross-sectional studies. Two studies did not specify duration. Twelve studies were conducted in urban settings, ten in rural settings, two in peri-urban settings and three in more than one setting.

3.2. Results of the synthesis: line-by-line coding and descriptive themes

Line-by-line coding resulted in 9 themes with each theme representing a CE activity (Table 2). All themes were predetermined from literature surrounding CE and guidance documents. The description for each activity is also listed in Table 2. Although some of the codes are closely related, they have unique issues that warranted their separation.

The final synthesis revealed closely related CE strategies; Formative Research Activities, Traditional or Community Leaders Support, Community Stakeholder Partnership, Community Sensitisation and Education, Community Advisory Mechanisms, Community Empowerment, Community Involvement and Communication protocols (Table 2). The themes described below in detail are not listed in chronological order of the likely activities that they would start and end with. Some of the strategies such as community sensitisation, education, community empowerment and community involvement overlap and are repeated during the research cycle.

3.3. Formative research activities

Studies in this review (Gappoo et al., 2009; Grinker et al., 2012; Mosavel et al., 2005; Ntshanga et al., 2010) describe activities like community entry processes that include consultations and information sessions with community stakeholders, political, traditional leaders discussing the proposal with the respective community committees before commencement of study activities. Ntshanga et al. (2010) describe highly involving consultations that were done through letters, phone calls, visits and community presentations over a period of 2 months. Mosavel et al. (2005), Thakadu

Table 1
Characteristics of publications from the systematic and purposive search.

Date	Country	Author	Title	Disease Studied	Time Mts	#of sites	Area
Publications that specifically described Community Engagement Activities							
2003	Zim	Ndekha et al.	Community participation as an interactive learning process: experiences from a Schistosomiasis control project in Zimbabwe	Bilharzia	48	1	R
2005	SA	Mosavel et al.	Community-based participatory research (CBPR) in South Africa: Engaging multiple constituents to shape the research question	Cervical cancer	24	1	P
2009	SA Zim	Gappoo et al.	Novel strategies implemented to ensure high participant retention rates in a community based HIV prevention effectiveness trial in South Africa and Zimbabwe	HIV/AIDS	24	3	U
2010	SA	Ntshanga et al.	Establishment of a Community Advisory Board (CAB) for tuberculosis control and research in the Inanda, Ntuzuma and KwaMashu (INK) area of KwaZulu-Natal, South Africa	TB	24	2	P
2010	SA	Ramjee et al.	Research experiences in conducting multiple community-based HIV prevention trials among women in KwaZulu-Natal, South Africa	HIV/AIDS	72	5	P/R
2012	SA Zim	Tedrow et al.	No "Magic Bullet": Exploring Community Mobilization Strategies Used in a Multi-site Community Based Randomized Controlled Trial: Project Accept (HPTN 043)	HIV/AIDS	36	5	R
2012	SA	Grinker et al.	"Communities in Community Engagement: Lessons Learned From Autism Research in South Korea and South Africa	Autism	48	2	R
2013	Zim	Campbell et al.	The role of community conversations in facilitating local HIV competence: case study from rural Zimbabwe	HIV/AIDS	24	1	R
2013	SA	Casale et al.	Conducting health survey research in a deep rural South African community: challenges and adaptive strategies	HIV/AIDS	24	1	R
2014	SA	Medeossi et al.	'I heard about this study on the radio': using community radio to strengthen Good Participatory Practice in HIV prevention trials	HIV/AIDS	84	1	U
2014	SA Zim	Woodsong et al.	Community and research staff collaboration for development of materials to inform microbicide study participants in Africa	HIV/AIDS	120	5	U/P/R
Publications where CE was described but was not the focus of the publication							
2004	Bots	Norr et al.	Impact of peer group education on HIV prevention among women in Botswana	HIV/AIDS	12	12	U
2005	Zim	Cowan et al.	Is Sexual Contact With Sex Workers Important in Driving the HIV Epidemic Among Men in Rural Zimbabwe?	HIV/AIDS	1	1	R
2005	Zim	Shetty et al.	The feasibility of voluntary counselling and HIV testing for pregnant women using community volunteers in Zimbabwe	HIV/AIDS	24	1	U
2006	Zim	Kjetland et al.	Genital Schistosomiasis in women: a clinical 12-month in vivo study following treatment with praziquantel	FGS	24	1	R
2007	Zim	Chandisarewa et al.	Routine offer of antenatal HIV testing ("opt-out" approach) to prevent mother-to-child transmission of HIV in urban Zimbabwe	HIV/AIDS	6	4	U
2008	Zim	Mangoma et al.	An enumeration of orphans and analysis of the problems and wishes of orphans: the case of Kariba, Zimbabwe	Orphan hood	24	1	U
2009	Bots	Baral et al.	HIV Prevalence, Risks for HIV Infection, and Human Rights among Men Who Have Sex with Men (MSM) in Malawi, Namibia, and Botswana	HIV/AIDS MSM	unknown	3	U
2010	Zim	Corbett et al.	Comparison of two active case-finding strategies for community-based diagnosis of symptomatic smear-positive tuberculosis and control of infectious tuberculosis in Harare, Zimbabwe (DETECTB): a cluster-randomised trial	TB	36	1	U
2011	Bots	DiAngi et al.	A Cross-Sectional Study of HPV Vaccine Acceptability in Gaborone, Botswana	HPV	1	1	U
2013	SA	Batist et al.	Outcomes of a community-based HIV-prevention pilot programme for township men who have sex with men in Cape Town, South Africa	HIV/AIDS	6	1	U
2013	Zim	Mavhu et al.	Enhancing Psychosocial Support for HIV Positive Adolescents in Harare, Zimbabwe	HIV/AIDS	2	1	U
Characteristics of publications from purposive search							
Abstracts							
2014	Bots	Chimbari et al.	Demonstrating the value for ecosystem approach to human health through the Botswana EcoHealth project (BEP) lens	Vector-borne diseases	48	1	U/P/R

Table 1 (*Continued*)

Date	Country	Author	Title	Disease Studied	Time Mts	#of sites	Area
2014	Bots	Magole et al.	Empowerment of flood recession farming communities in the Okavango Delta	Vector-borne diseases	48	1	U/P/R
Technical project files							
2014	Bots	Magole et al.	An EcoHealth Approach to Flood Recession (Molapo) Farming to Reduce Climate Change Vulnerability in the Okavango Delta, Botswana	Vector-borne diseases	48	1	U/P/R
2005	Zim	Chimbari et al.	A prospective ecosystem based case study to determine the influence of vlei irrigation on malaria transmission: An opportunity for formulating an appropriate malaria control strategy	Malaria	12	1	R
Publications							
2014	Zim	Rurinda et al.	Sources of vulnerability to a variable and changing climate among smallholder households in Zimbabwe: A participatory analysis	Climate change	36	2	R
2011	Bots	Thakadu et al.	Communicating in the Public Sphere: Attitudes Toward Different Public Instructional Communication Methods	Climate change	48	3	R
2013	Bots	Okatch et al.	Perceptions of safety and efficacy of traditional medicines by community members in Botswana	Traditional Medicines	Unknown	4	R

R = Rural; P = Peri-urban; U = Urban.

et al. (2015) and Rurinda et al. (2014) describe ethnographic interviews to introduce themselves to the community, establish communications, build trust, and invite local critique and feedback of their study. Activities such as ethnography, participatory rural appraisals, site entry, and site selection allow a researcher to familiarise with a community for its suitability for a study. Formative research activities usually constitute the initial activity of CE. The best practise is to make this a formal and informal continuous process because communities are dynamic making it impossible to understand all aspects of a community at the beginning of a study (Tedrow et al., 2012; UNAIDS, 2011).

3.4. Traditional and/or community leaders support

This review showed that support and buy in of traditional, political, community, and administrative leaders will lead to a research friendly environment (Campbell et al., 2013; Ndekha et al., 2003; Ramjee et al., 2010). These leaders include chiefs, councillors, teachers, and traditional and faith healers. Studies have endeavoured to educate community leaders and even involve them in recruitment and information dissemination to try and enhance their engagement processes. In order to succeed it is essential that community leaders approve and support studies, so that they can motivate and mobilize their own communities. The value of community leaders has been documented in stigmatised populations such as men who have sex with men (MSM). Baral et al. (2009) reported that community leaders participated in planning and facilitating all activities, disseminating HIV-prevention information and provided healthcare referrals for MSM. Okatch et al. (2013) reported using the village leaders' platform as an opportunity to establish a sense of trust between the researchers and the community. Other studies (Ndekha et al., 2003; Tedrow et al., 2012) also reported on the challenge of having community leader involvement. These studies reported instances where project activities became unfairly centralised in a community leader's area or where the involvement of a village was stopped by a leader due to lack of understanding of research processes. The success of this strategy is based on having leaders understand potential benefits of research first before they endorse the research in their communities (Minkler, 2005).

3.5. Community stakeholder partnership

This strategy involves forming partnerships with local stakeholders such as Community Based Organisation (CBOs), Non-Governmental Organisations (NGOs), Government departments,

local municipalities, religious and traditional leaders (Ntshanga et al., 2010; UNAIDS, 2011; Woodsong et al., 2014). These strategic partnerships also include utilisation of existing community structures such as development committees, teams or groups instead of forming new ones for the sole purpose of a study (Ndekha et al., 2003). Existing structures can be modified to suit both their original work plus any additional project duties (Tedrow et al., 2012). Studies that reported using this strategy indicated that they utilised pre-existing forums or structures such as community action groups (CAGs), community working groups (CWGs) to form CABs that disseminate project information, facilitate access to community networks, enhance post-study sustainability, and improve understanding of the local context (Casale et al., 2013; Medeossi et al., 2014; UNAIDS, 2011). Medeossi et al. (2014) described an innovative partnership where they utilised two existing community radio stations to enhance CE through a weekly community radio talk show. This strategy assisted in communication, recruitment, dissemination of general health information and promoted a continuous community dialogue between the researchers and the community. Based on its experience from previous projects IDRC (2012) cautions that although this strategy facilitates integration and smooth implementation of a study, partnerships need to be revaluated continuously as each stakeholder might have different focus and motives which may be incompatible with the scientific rigor and adherence to strict protocols required by researchers.

3.6. Community sensitisation and education

Once formative research, community entry and formation of partnerships is initiated other CE activities such as sensitisation and education commence. Sensitisation and education is viewed both as part of the research cycle and also a CE strategy. This is a continuous process and may start before permissions are granted as the community might request that they be sensitised before deciding a study might be beneficial to them (Ndekha et al., 2003). Sensitisation can be formal involving workshops, meetings, training radio and newspaper advertisements (Corbett et al., 2010; Kjetland et al., 2006; Mangoma et al., 2008; Shetty et al., 2005) or informal including wearing of study regalia, presenting drama skits at public places (Chandisarewa et al., 2007; Corbett et al., 2010) and using a loudspeaker to publicise meetings. Tedrow et al. (2012) described innovative sensitisation activities as follows:

"...teams arranged sporting events, community dramas, dancing competitions, and even movie showings in some sites.

Table 2
Community engagement descriptive themes.

CE Activity	Description	Relevant Quotes from Studies
Formative Research Activities	Conducting any form of formal or informal research to characterise the community, participants and stakeholders	"...The first step in community engagement was to identify stakeholders and arrange ethnographic interviews. These included parents, teachers, health-care professionals, traditional healers, and clergy..."(Grinker et al., 2012) "...Firstly, six consultative workshops were organized with the assistance and permission from village leaders, 'Dikgosi' (chiefs), in recognition of the Setswana cultural governance systems. The purpose of these workshops was to establish a sense of trust between the researchers and the community and to create an opportunity for the researchers to inform the community about the aims of the study and possible outcomes...." (Lippman et al., 2014)
Traditional or Community Leaders Support	Traditional, administrative leaders giving permission, recruiting participants, giving permission, advising, organising meetings, facilitating research in their communities.	"...The initial phase of the project involved education and motivation of the community leaders. These included chiefs, councillors, teachers, and traditional and faith healers. In order to succeed with CBR it is essential that community leaders have sanctioned the programme, so that they can motivate and mobilize their own people."(Kamuya et al., 2013) "...The six-month pilot programme trained five community leaders who, along with staff, provided HIV-prevention information and supplies to MSM through small-group meetings, community-based social activities and inter-community events." (Batist et al., 2013)
Community Stakeholder Partnership	Forming partnerships with other local stakeholders such as CBOs, NGO, Government departments to assist in communication, recruitment, dissemination of information	"...Research in Manguzi was carried out with the support of a well-established and respected local community-based non-governmental organisation (NGO), Tholulwazi Uzivikele ('Empower yourself through knowledge'), that had been working since the mid-1990s in the greater Manguzi area; the NGO's activities included community based orphan care, early childhood and youth development, HIV prevention and community volunteerism. We engaged with Tholulwazi Uzivikele because of the many known advantages of such community-academic collaborations." (Casale et al., 2013) "...Given the hidden nature of MSM in these communities, participants were recruited by in-country community-based organizations (CBO) with experience working with gay, bisexual, and other MSM. In-country technical support was provided as requested by the CBOs." (Chantler et al., 2013)
Community Sensitisation and Education	Events that sensitise the community about the study such as PRAs, public meetings, village gatherings, pamphlet distribution, door to door sensitisation, informal communication, road shows, motorcades, study regalia distribution	"...teams arranged sporting events, community dramas, dancing competitions, and even movie showings in some sites. Additionally, the South African sites held 'road shows' and "motorcades" during which all project vehicles would tour the communities together, broadcasting music and creating an almost festival-like atmosphere. Sometimes local celebrities and community leaders would attend these events, dramatically increasing participation." (Tedrow et al., 2012) "...A drama skit was developed and presented at health worker in-service training workshops and at the community advisory board meetings for critiques and comments before presentation. The community counsellors performed the skit on a rotational basis at the four clinics on Tuesday, Wednesday and Thursday mornings for new ANC clients and during the afternoons in the community and at colleges, churches and industrial facilities." (Chandisarewa et al., 2007)
Community Advisory Mechanisms	Strategies that facilitate meaningful informal or formal dialogue and accountability among research teams and relevant stakeholders in the community.	"...When CHAMP was first introduced in South Africa, a steering committee was initially formed, comprising researchers and traditional and political leaders from the target site. This steering committee oversaw the entry of the CHAMPSA program into the area as well as the initial adaptation and piloting of the CHAMPSA manualized intervention." (Bell et al., 2008) "...Randomisation was done by selection of red and black coloured discs (23 of each colour), which were otherwise identical, from an opaque bag held above eye-level. Discs were withdrawn at a public meeting by community advisory board members representing each cluster." (Corbett et al., 2010)
Community Empowerment	Activities include Training and Hiring Local people to collect data and recruit participants	"...We used youth researchers to collect data from the HIV positive young people in an attempt to maximise participation and disclosure of sensitive issues. Involving youth researchers in research design, implementation and analysis as well as subsequent intervention development provided a framework for increasing child participation in research and programming." (Mavhu et al., 2013) "...Local Botswana high school graduates conducted interviews as part of a capacity building collaboration with the Botswana government. Interviewers received training about cervical cancer and appropriate translations for medical terminology from a Motswana obstetrics and gynaecology physician". (Diallo et al., 2005)
Community Involvement	Community participating in site selection, protocol development, participant identification, or identification of sites	"...The educational materials for participants in both trials use illustrations. In both studies, local input was used to develop the main characters for print materials, which included a study participant, her partner and a staff member at the research site. Since both studies included participants from multi-cultural settings, local staff and community advisors advised that the characters be somewhat neutral, avoiding attire and hairstyles that could be identified with a specific ethnic group." (Woodsong et al., 2014) "...A series of community meetings were organised at each site to (i) record farmers perceptions of climate variability and change; (ii) identify issues and problems affecting farmers in the face of climate variability and change; (iii) describe who is vulnerable and establish the causes; (iv) identify adaptation options used by different farmers during drought and flood years. These participatory diagnostic meetings were also helpful in designing relevant and clear questions for the farm diaries and for the household questionnaire survey that were implemented to study in more detail the above mentioned key issues...." (Mosavel et al., 2005)
Communication Protocols	Strategies that allow open channels of communication about the a study throughout its life-cycle	"... The BEP, realizing the importance of knowledge translation, developed a communication strategy to guide and facilitate effective communication, dialogue, feedback and knowledge sharing among stakeholders. In pursuit of promoting knowledge translation and adoption of research innovations, the strategy provided to undertake empirical research to explore communication behaviors and patterns of the stakeholders so as to inform practice. The strategy was founded on a comprehensive stakeholder analysis to ensure relevance and appropriateness of communication channels and methods." (Medeossi et al., 2014)

Table 2 (*Continued*)

CE Activity	Description	Relevant Quotes from Studies
		"…Investigators held on-going workshops, training sessions and meetings with CWG members and stakeholders throughout the duration of each of the trials (approximately 2–3 years). Clinical site staff also participated in community events such as Women's Day, World AIDS Day, and HIV awareness days." (Ramjee et al., 2010)

Additionally, the South African sites held 'road shows' and "motorcades" during which all project vehicles would tour the communities together, broadcasting music and creating an almost festival-like atmosphere. Sometimes local celebrities and community leaders would attend these events, dramatically increasing participation……Soweto, and other sites distributed incentives, such as ball caps and T-shirts, to spread awareness. Soweto painted their mobile caravans bright green to attract attention. Soweto and Vulindlela began using a megaphone to announce the time and location of upcoming activities and VCT services…they found the technique useful for communicating to people…"

These activities usually take much time, human and financial resources to allow a community enough time to understand the study's objectives, procedures and benefits. Most projects employ local community liaison officers/volunteers who will ensure that the projects do not miss key areas and groups of people who might need sensitisation. This CE strategy is linked with the stakeholder partnerships because the stakeholders will usually allow use of their forums or platforms for study sensitisation and education activities. Keeping the community informed and engaged also allows the researchers to engage in CE activities that might need to be re-evaluated during the research process. Casale et al. (2013) acknowledge that communities are dynamic resulting in a need for flexibility and speedy adjustments in sensitisation and education strategies.

3.7. Community advisory mechanisms

The GPP describes these mechanisms as informal or formal strategies that facilitate meaningful dialogue between research teams and the relevant stakeholders about planned or on-going research. This facilitates open engagement with research goals, processes, and results. They can be built and sustained by the study or may already exist in the area (UNAIDS, 2011). Informal advisory mechanisms involve research teams seeking relevant stakeholders' views through community meetings, local events, focus group discussions, interviews, consultations, and suggestion boxes. Ramjee et al. (2010) report using suggestion boxes at each of the sites allowing women to air their views anonymously, and a weekly review of these suggestions were used to improve the conduct of the study. The same study also reported having a toll-free number to anonymously report any problems which they may have experienced during participation.

The CABs/CAGs/CWGs constitutes most popular formal advisory mechanisms and one study (Mosavel et al., 2005), reported having a community-based "reference team". Typically these involve establishing a group of community stakeholders who share a common identity, history, language, and culture that develop an on-going relationship with the research team at a particular trial site (UNAIDS, 2011).These groups help researchers gain trust and acceptance in communities provide, the community with a forum for shaping, commenting on, critiquing, and helping to guide researchers (Tedrow et al., 2012). CABs/CAGs/CWGs are expected to represent the voice and interests of the community throughout the research process. Ntshanga et al. (2010) described an elaborate process of forming, training and sustaining a CAB for a 2 year study. The role of that CAB was to provide a mechanism for

community consultation and participation that contributed to community empowerment through shared decision-making about that research.

This CE strategy also has its own shortcomings. Tedrow et al. (2012) stated that issues arose regarding the specific roles and responsibilities of their CWGs because the study inherited existing power dynamics within communities prior to the arrival of the study. The CWG was also viewed at times as aligning more with the researchers than their own community. The selection of the CWG members resulted in a flare up of jealousy when certain community members were not chosen to become members of the CWG. This example shows that thorough formative research needs to be conducted so as to select both formal and informal advisory mechanisms.

3.8. Community empowerment

In this review community empowerment was defined as any capacity building activity at individual, or community level. Individual level empowerment included the training and hiring of local people to collect data and recruit participants (Batist et al., 2013; DiAngi et al., 2011; Mavhu et al., 2013; Norr et al., 2004). These activities ranged from simple training on how to recruit participants up to certificate level training to enable them to collect data and/or implement an intervention. Some studies described activities where they engaged youths and high school graduates to collect data after receiving extensive training (Chimbari et al., 2014). Norr et al. (2004) described a scenario where the trained peer leaders continued to offer the intervention or parts of it to their co-workers and the community at large even after research funding ended.

At community level, the formation of CABs/CAGs/CWGs can be viewed as a means of empowerment because formation of new linkages and structures enable communities to participate in health research with an improved understanding of scientific content and capacity for addressing scientific issues (Magole and Chimbari, 2014).

Whilst empowerment is a noble idea, some projects (Casale et al., 2013; Norr et al., 2004) reported challenges in selection of individuals for field work as most communities already had existing power dynamics and high levels of unemployment. However, to ensure success of this CE strategy careful consideration, well-designed studies, training materials, and professional assistance is required (Morin et al., 2008).

3.9. Community involvement

In this review community involvement was regarded as any activity that indicates that the community participated in any aspect of the research cycle above and beyond providing data or the other CE strategies mentioned above. Community participation in protocol development, site selection, participant identification, data analysis and dissemination of results were considered during coding to allow differentiation with other CE strategies as they overlap.

The majority of publications in this review showed that communities are engaged at the stage of developing context specific tools for the studies (Chimbari et al., 2014; Grinker et al., 2012; Mosavel et al., 2005; Ramjee et al., 2010; Woodsong et al., 2014)

and none indicated if the communities were involved in the initiation or development of the proposals and/or seeking for funds. The activity that communities contribute most is contextualising the study materials such as consent forms, questionnaires, posters, flyers and brochures for socio-cultural acceptability. Communities are reported to participate in translations piloting research instruments and assessing the clarity for cultural relevance. Mosavel et al. (2005) reported that the involvement of the community in contextualising their work resulted in a complete shift in their study; from "*cervical cancer*" to "*cervical health*" reflecting that generally women face challenges that far exceed the boundaries of, and interventions for, cervical cancer which the study had focused on originally. Ramjee et al. (2010) also stated that some of their participants later became volunteer peer educators narrating their own experiences to potential participants and later also assisted in recruitment, retention and formulation of trial results messaging and dissemination (Tedrow et al., 2012).

Whilst community participation is a CE strategy that is essential for creating a conducive research environment it is important that projects do not interfere with the day to day activities of the community members. Interaction with other organisations in the area also assists in reducing continuous interruption of communities thereby competing with household and other livelihoods chores thus discouraging participation (Chimbari et al., 2005)

3.10. Communication protocols

Communication protocols/plans were defined as any formal or informal strategies that allowed open channels of communication about a study from inception to dissemination of results. This includes community education and sensitisation strategy. Studies noted in this section are those that reported to have actually developed a separate communication protocol/plan. Thakadu et al. (2015) developed a communication plan that included stakeholder outreach; decision and policy-makers; researchers; community and media interaction. That study made a deliberate plan that recognised the communication needs and preferences of the various project's stakeholders and systematically collected information on commutation activities to ensure that the views of different stakeholders were incorporated into the project or addressed at each stage (Magole et al., 2014; Thakadu et al., 2015). Other studies reported holding feedback regular meetings, community radio shows to stay connected with their participants and community (Mosavel et al., 2005; Ndekha et al., 2003; Tedrow et al., 2012). Due to its time-consuming nature and logistical complexity, the success of this strategy requires a specific budget line item (Magole and Chimbari, 2014).

In summary, all activities are interlinked and studies use various combinations of CE strategies for a single study. It was not possible to measure any linkage or association of CE activities to the setting of the study, duration or type of disease or phenomenon being studied, because the publications reviewed were not focusing on describing CE. There could have been more than one CE strategy in a given study but the information might not have been relevant for the publications that we reviewed.

4. Discussion

The objective of this review was primarily to inform the development of CE strategy for multicentre studies. Out of the three multi-country studies only two (Grinker et al., 2012; Tedrow et al., 2012) described the differences in their CE strategies per country and the rest of the studies shared the combined strategies for all sites. These two studies emphasised that the basic principles of the strategy were the same but differed at implementation stage.

Once a CE strategy is developed such as involvement of leaders or CAB formation it depends on the context of the site how it would be implemented. For instance (Tedrow et al., 2012) shows that in Zimbabwe the community partnerships were mainly with food and agricultural NGOs and CBOs because the main challenge there was hunger whilst in South African sites the challenge was employment so they partnered with skills building organisations. Grinker et al. (2012) also reported that in one of their sites the focus was on the community sensitisation process aimed at assuring confidentiality and in another site it was on explaining reasons why the study was not focusing on HIV/AIDs as well. This was because of the different social contexts of the two sites. These studies revealed how the concept of CE standardisation across multiple sites is not easy to implement and how flexibility is crucial (Grinker et al., 2012; Ramjee et al., 2010; Tedrow et al., 2012; Woodsong et al., 2014).

It was difficult to evaluate which strategies actually worked because CE was not the central concern of 55.6% the studies in this review particularly in Botswana and Zimbabwe. CE activities of research studies seldom result in a full publication but are reported as part of research processes. The purposive search at known institutions and researchers from the two countries showed that there is CE in their research but the published work does not reflect this. CE appeared in the technical reports and abstracts hence would not appear systematically in the peer reviewed journals in titles, abstracts or keywords.

As a result of the paucity of CE publications there is insufficient evidence to determine whether one particular strategy of CE is more effective than the other. An analysis of the publications shows that the negative aspects or unsuccessful community engagement activities or mistakes that were made; are very rarely reported; except for publications that had initially set out to describe their strategies (Gappoo et al., 2009; Mosavel et al., 2005; Ndekha et al., 2003; Ramjee et al., 2010; Tedrow et al., 2012; Woodsong et al., 2014). Negative aspects of a failed strategy are not likely to be published by most authors.

This review also showed that the bulk of the CE activities occur simultaneously and can be repeated throughout the cycle of the research process (Casale et al., 2013; Gappoo et al., 2009; Mosavel et al., 2005; Ntshanga et al., 2010; Tedrow et al., 2012; Woodsong et al., 2014). It is clear though that formative research of a study site gives the researcher the opportunity to choose the correct combination of activities to include in a CE strategy. Once formative research is initiated and all permissions are granted there is no hierarchy or sequence of events and no event seems more important than the other, everything depends on the context of the study and where it is situated. One activity might be conducted at intervals throughout the study duration, such as sensitisation, or education or stakeholder advisory meetings.

The results of this review are consistent with findings from other published reviews on CE (Simon et al., 2007; Tindana et al., 2015) that have also shown the importance of engaging the community in formative research at early stages so as to pave the way for lasting relationships. There is also consistency in that the jury is still out on what counts as successful community engagement and how it can be measured (Hood et al., 2010; MacQueen et al., 2015; Tindana et al., 2015).

4.1. Best practices

This CE review has shown that even though the general principle of a strategy might be the same, CE is highly contextual and the best way to develop a strategy is to review studies that have been carried out in the same context as a proposed study to prevent loss of time and resources. Even with the limits of generalizability of our findings the use of the GPP and H3Africa guidance documents (H3Africa-Consortium, 2014; UNAIDS, 2011) is still highly

recommended. These guidelines set out a host of activities that can be followed according to the context of a study. They are specifically developed for HIV/AIDs and genetic research but the activities described in document can easily be adapted for other health research projects.

4.2. Research agenda

The findings of this review indicate further research on how to measure the effectiveness of a CE activity in a given community. There are current attempts to develop and advocate for evaluation tools for CE and its associated activities (Draper et al., 2010; MacQueen et al., 2015; Newman, 2006). A concise evaluation framework that can be used by all community based researchers would be advancement in the CE field. The tool should ideally measure the perceived effectiveness of each strategy from the view of the community and not only through the researchers' lens.

4.3. Educational implications

The data presented in this review may be useful in the training of researchers and Ethics Committee members. For instance, every submission to a sponsor or ethics committee that indicates community based work should have a clear flexible CE plan that should be reviewed before approval. Training could be directed to assist researchers to attend to CE issues more carefully in their proposals.

4.4. Limitations of the study

This descriptive study is based primarily on information gathered from 27 publications of which 13 were not focusing on describing a CE strategy but were reporting on their research process. Of the remaining 14 only 3 were directly discussing CE and the others focused on participant mobilisation, recruitment and/or retention. Therefore, the small sample size and potential for interpretation bias are limitations. Furthermore, all the publications focused solely on researcher's perspectives of CE and it would have been valuable to have publications on opinions of community members. We believe that all the activities described and reported in the publications actually form part of the CE process for any study.

5. Conclusions

The review has shown the importance of formative research of a community in the development of CE. Community involvement activities in its various forms can then proceed and evolve as the study progresses. For any CE strategy to be sustainable it needs to be flexible and able to adapt to community changes. We also conclude that since communities are heterogeneous and unique, CE activities will not have similar effects in different settings. The review provides sufficient information to develop a CE strategy for a multicentre study using the various strategies and activities described.

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