Annex 5: themes and sub-themes from our qualitative synthesis

Current practices in involving communities in research		
Main theme	**Sub-theme**	**Studies**
Awareness creation and sensitization on the research	Use of drama	Mwinga & Moodley (2015) Tindana *et al*. (2017) Simwinga *et al*. (2018) Asante *et al*. (2013)
	Use social media	Simwinga *et al*. (2018) Meiring *et al*. (2019) Tindana *et al*. (2017)
	Use of documentaries and digital storytelling	Asante *et al*. (2013) Tindana *et al*. (2017)
	Use of open community forum (Submission and discussion of study proposal and other concerns)	Simwinga *et al.* (2016) Petersen *et al*. (2012) Musesengwa & Chimbari (2017) Mukaratirwa (2017)
	Use of community durbars	Paulina *et al.* (2011) Asante *et al.* (2013)
	Use of mobile vans with key messages	Meiring *et al*. (2019)
	Use of leaflets	Asante *et al.* (2013)
Co-creation	Community capacity building	Petersen *et al*. (2012) Musesengwa & Chimbari (2017) Nyirenda *et al*. (2020) Brear *et al.* (2020)
	Community input into the protocol and study instruments development	Mwinga & Moodley (2015)
	Use of Community Advisory mechanism and community liaison officer (CLO) (Formation community advisory boards (CABs)	Musesengwa *et al.* (2017) Musesengwa *et al.* (2018)
	Forming community coalitions and partnerships	Musesengwa *et al.* (2017)
Barriers to effective engagement of communities in research		
Main theme	Sub-theme	Studies

Prohibitive cultural, historical and religious context	Restrictions on visiting homes of newborn	Hamer *et al.* (2015)
	Religious ideologies	Ndekha *et al.* (2003)
	Mistrust regarding the research (Due to historical colonial exploitation) and having suspicions towards research institutions (university or other "outside" involvement)	Newman *et al.* (2015) Kagee *et al.* (2020) Ndekha *et al.* (2003) NMalayirenda *et al.* (2018) Mosavel *et al.* (2005)
Geographical/Spatial limitation	Dispersed nature of communities	Hamer *et al.* (2015)
	Poor road networks	Kagee *et al.* (2020) Asante *et al.* (2013)
	Distance challenge due to size of the area of coverage	Ndekha *et al.* (2003)
Ineffective stakeholder engagement	Obtaining consent from study individuals without seeking consent from leadership of the community	Nyika *et al.* (2010)
	Failure to do proper community entry by researchers	Mlambo *et al.* (2019) Musesengwa *et al.* (2017)
Difficulty in planning and executing community engagement activities	Engagement process taking longer than planned due to the step-wise procedure	Nyika *et al.* (2010)
	Lack of / limited formative research	Simwinga *et al.* (2018)
	Time constraints / wasting time in obtaining permission from community, political, and administrative officials	Brear *et al.* (2020) Musesengwa *et al.* (2018) Simwinga *et al.* (2018)
Unmet community expectations	Raising expectations of the community to levels beyond what the proposed research may be able to address	Nyika *et al.* (2010)
	Monetary expectations (Lack of monetary incentives)	Nyirenda *et al.* (2018) Ndekha *et al.* (2003) Nyika *et al.* (2010) Simwinga *et al.* (2018)
	Unmet expectations from previous research experience	Asante *et al.* (2013)
Communication barriers	Language barrier in communicating important scientific concepts to community	Newman *et al.* (2015) Kagee *et al.* (2020) Surakat *et al.* (2017)
	Misinformation	Kagee *et al.* (2020)
	Language and literacy barrier in obtaining informed consent	Mtove *et al.* (2018)
	Misconceptions that inhibit effective communication	Newman *et al.* (2015)

	Limited understanding of health research and lexicon challenges	Nyirenda *et al* (2018) Newman *et al*. (2015)
	Low literacy levels of community members to fully comprehend the nature or concepts of the research	Newman *et al*. (2015) Mwinga *et al*. (2015) Musesengwa (2017)
	Inadequate feedback to the community by the research team	Mwinga *et al*. (2015)
Inadequate representativeness of community stakeholders	Difficulty in achieving a balanced selection of ethnic diverse community stakeholders	Newman *et al*. (2015)
	Lack of a designated focal persons for the CAB	Mwinga *et al*. (2015)
	Limited financial resources (Huge commitment of financial resources)	Mwinga & Moodley (2015) Mlambo *et al*. (2019) Musesengwa *et al*. (2018) Surakat *et al*. (2017) Brear *et al*. (2020)
Multiple research projects at the same time	Competing research projects	Musesengwa *et al*. (2018) Musesengwa *et al*. (2017)
	Conflicting agenda	Musesengwa *et al*. (2018)
Negative experience from previous studies	Failure of previous research to achieve intended objectives	Essack *et al*. (2012)
	Personal questions that communities are not comfortable with from previous research experience	Essack *et al*. (2012)
	Disappointment from not being included in previous studies	Essack *et al*. (2012)
Facilitators of effective community engagement in research		
Main theme	Sub-theme	Studies
Effective community entry and engagement of stakeholders at beginning of the research	Engaging first, traditional and then religious leaders	Tindana *et al*. (2017) Hamer *et al*. (2015) Newman *et al*. (2015) Mtove *et al*. (2018) Mosavel *et al*. (2005) Mwinga *et al*. (2015) Musesengwa *et al*. (2018) Paulina *et al*. (2011) Simwinga *et al*. (2016)
	Engagement of community-level political leaders	Tindana *et al*. (2017) Hamer *et al*. (2015)
	Engagement of communities during protocol formulation stages	Newman *et al*. (2015)
	Engagement of civil society organizations	Simwinga *et al*. (2016)

	Social mapping	Hamer *et al.* (2015)
		Paulina *et al.* (2011)
	Paying close attention to clear channels of authority in the local communities	Paulina *et al.* (2011)
Effective community engagement strategies	Two-way communication with communities to discuss issues that may be of concern to them	Nyika *et al.* (2010)
	Openly acknowledging the role that the entire community plays in the research	Simwinga *et al.* (2018)
	Utilisation of strong communication skills (Use of social marketing Strategies)	Kagee *et al.* (2020) Mosavel *et al.* (2005)
	Good cultural knowledge by researchers	Mosavel *et al.* (2005)
	Effective use of existing social structures and networks in the communities	Mlambo *et al.* (2019)
	Adding fun to all activities and use of participatory methods	Simwinga *et al.* (2018)
	Use of new technologies and computers in engagement	Simwinga *et al.* (2018)
	Holding of regular feedback meetings with stakeholders	Musesengwa *et al.* (2017) Musesengwa *et al.* (2018) Mwinga *et al.* (2015) Simwinga *et al.* (2018)
	Carrying out targeted sensitisation campaigns to ensure that community members understand the research objectives and deliverables	Musesengwa *et al.* (2017) Ndekha *et al.* (2003)
	Active involvement of community in decision making	Petersen *et al.* (2012) Musesengw *et al.* (2018) Wariri *et al.* (2017) Paulina *et al.* (2011)
	Creation of community fora such as "participative spaces" and/or "participatory workshops	Musesengwa *et al.* (2017)
Community empowerment	Training and recruitment of local staff for the research (as research assistants)	Ndekha *et al.* (2003)
	Formation of community advisory boards (CAB)	Simwinga *et al.* (2018) Kagee *et al.* (2020) Mosavel *et al.* (2005) Mwinga *et al.* (2015) Musesengwa *et al.* (2017) Mlambo *et al.* (2019)

	Involvement of marginalized groups	Wariri *et al*. (2017)
	A strong collaboration with the local information service department	Asante *et al*. (2013)
Community motivation	Financial incentives	Simwinga *et al*. (2018
	Training and motivation of community leaders	Ndekha *et al*. (2003)
	Non-financial incentives	Simwinga *et al*. (2018)

Ethical considerations needed in engaging communities in research

Main theme	Sub-theme	Studies
Cultural considerations	Gaining understanding of community perspectives, beliefs, cultural values, and practices.	Tindana *et al*. (2017)
	Adopting culturally appropriate ways to communicate research information to communities (Respect for local concerns and norms)	Nyika *et al*. (2010) Kamuya *et al*. (2017) Mosavel *et al*. (2005)
	Research involving difficult and complex topics need to be evaluated for their effectiveness within the cultural context.	Tindana *et al*. (2017)
Community autonomy	Autonomy of communities in decision making needs to be enhanced	Mtove *et al*. (2018)
	Community Advisory Boards (CAB) should be able to carry out their functions independently of the research team in order to protect the community from any unethical research practices	NMalayirenda *et al*. (2018)
	Avoidance of structural coercion	Nyirenda *et al*. (2020)
	Avoidance of the use of coercive methods in referral or recruitment of participants	Simon & Mosavel (2010)
	A need for research involving young people to be evaluated for their effectiveness	Tindana *et al*. (2017)
Review of research protocols	Effective review of research protocols (including questionnaire, informed consent forms) before the engagement	Mtove *et al*. (2018) Mwinga & Moodley (2015)
Informed consent	A need to obtain community informed consent before engagement	Mosavel *et al*. (2005) Mlambo *et al*. (2019) Musesengwa *et al*. (2017)

	Ensuring appropriate consenting processes in populations with low literacy or limited exposure and experience with research	Kamuya *et al*. (2017)
Avoidance of community exploitation	Exploitation of locally recruited researchers through unfair employment practices needs to be stopped	Simon & Mosavel (2010)
	Ensuring the avoidance of power imbalance and dynamics between researchers and community	Simwinga *et al*. (2018) Nyirenda *et al*. (2020) Nyirenda *et al*. (2018) Kagee *et al*. (2020)
Ensuring fidelity	Respect for initial research plans	Kagee *et al*. (2020)
	Avoid carrying out activities that are outside of the initial protocol	Mlambo *et al*. (2019)
Risks and Benefits	Providing adequate information on research goals, risks, and benefits (Study benefits and compensations need to be made clear to community)	Mlambo *et al*. (2019) Kamuya *et al*. (2017)
	Avoiding research-related harm (actually ensuring safety of communities when conducting study activities	Simwinga *et al*. (2018) Paulina *et al*. (2011) Meiring *et al*. (2019)
Privacy and confidentiality	Ensuring privacy of community and study participants	Mlambo *et al*. (2019)
	Ensuring confidentiality of community and study participants	Mlambo *et al*. (2019)

Current trends on how gender is taken into account when engaging communities in research

Main theme	Sub-theme	Studies
Gender and consent	Household consent decision making	Kamuya *et al*. (2017) Mtove *et al*. (2018)
Gender of field workers	Influence of gender of the field worker on engagement	Kamuya *et al*. (2017)
Gender equality	Presence of both gender at stakeholders meeting	Paulina *et al*. (2011)
	Avoidance of cultural tensions regarding researchers working closely with women (sensitive questions)	Paulina *et al*. (2011)
	Avoidance of gender-biased research agenda (over concentration of research on women [too much concentration	Asante *et al*. (2003)

	on women at the expense of the health of the men])	