Community-Based Rehabilitation Services in Low and Middle-Income Countries in the Asia-Pacific Region: Successes and Challenges in the Implementation of the CBR Matrix

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ABSTRACT

Purpose: *This literature review aims to explore the importance of physical therapy services and the increasing awareness of CBR, specifically related to challenges in its implementation in low and middle-income countries in the Asia-Pacific region.*

Method: *A literature review of multiple databases was conducted to locate relevant articles written within the past five years. The databases used for the search were Google Scholar, Cochrane Library, CINAHL, and PubMed.*

Results: *Thirteen articles about CBR were included in the literature review. These consist of studies on the quality of life, access to healthcare services, and barriers to CBR, as well as about the impact of CBR to LMICs and stakeholders. The articles demonstrate the vast potential of CBR, especially in LMICs in the Asia-Pacific region, with a significant positive impact on the lives of people with disabilities.*

Conclusion: *CBR has improved the quality of life, access to medical services, functional independence, autonomy, community inclusion, and empowerment of people with disabilities in LMICs in the Asia-Pacific region. However, challenges in the implementation of CBR remain. These include lack of awareness and understanding of CBR, and physical, environmental, socio-economical and personal barriers.*

Key words: *Community-based rehabilitation (CBR), Asia-Pacific region, physical therapy impact, progress, barriers.*

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INTRODUCTION

Basic human rights and community inclusion have been constant struggles for people with disabilities, especially in low and middle-income countries (World Health Organisation, 2010). Poverty, poor healthcare services and access to care are the main challenges in preventing people with disability from fully participating in all domains of life. The problem is worse in rural and isolated communities where people have to travel many kilometres on foot and often cross rivers to access services.

Approximately 15% of the world's population is living with a disability; moreover, 80% of people with disabilities live in an emerging country (World Health Organisation, 2014). People who are both poor and have a disability account for 1.57% of the population (1,443,000 persons) in the Philippines and 1.7% of the population (1.1 million persons) in Thailand (Nualnetr and Sakhornkhan, 2012; Philippines Statistics Authority, 2013). Both countries have no guaranteed access to care for people who cannot afford to pay. In low and middle-income countries (LMICs) only between 5% and 15% of people with disabilities have access to assistive devices; furthermore, there are no rehabilitation services available in 62 countries (World Health Organisation, 2010).

Health promotion and prevention programmes supported by the World Health Organisation (WHO) rarely extend to people with disabilities (Deepak et al, 2011). Barriers to access for people with disability include affordability and cost efficiency, limited availability of healthcare services, physical barriers (such as ramps), and poorly trained healthcare workers (World Health Organisation, 2014). In addition to physical barriers, numerous environmental, financial and personal barriers also affect access to healthcare (Morita et al, 2013; Van Hees et al, 2014).

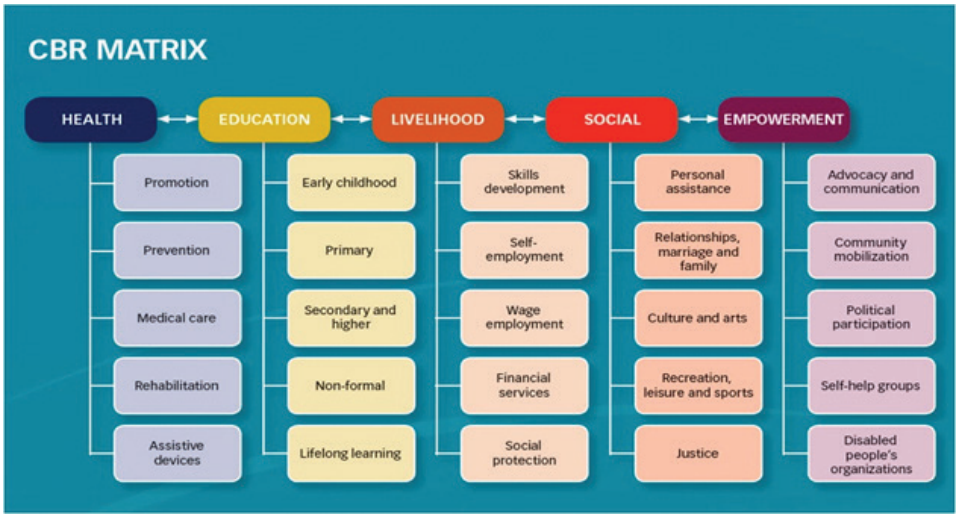
In the 1970s and 1980s, the World Health Organisation initiated Community-based rehabilitation (CBR) as an approach to address issues about disability and limited access to rehabilitation (Deepak et al, 2013; Karthikeyan and Ramalingam, 2014). The main objectives of CBR are decreasing and eradicating poverty through increasing opportunities for better health and education (World Health Organisation, 2010). By doing this, employment opportunities become available to people with disabilities, and thus create overall better quality of life. However, CBR programmes are not just for developing countries because the principles are adaptable to developed countries (Helander, 2007).

The CBR initiative includes the engagement of the community to help change the psychosocial atmosphere and break the isolation of those with disability and consequently excluded. In addition, increasing opportunities for people with disabilities will make human rights a reality. Inclusion of people with disabilities by individuals in their community will promote a sense of dignity, purpose, and mutual respect (World Health Organisation, 2010).

The CBR Matrix

The CBR Matrix was developed in 2004 to help focus community development initiatives as well as serve as a foundation of CBR programmes and projects (World Health Organisation, 2010; Deepak et al, 2012; Mauro et al, 2015). The Matrix is comprised of five elements: health, education, livelihood, social, and empowerment (see Figure 1). The first four components are considered key factors in multi-area development. Empowerment of people with disabilities, their families, and communities is addressed by the final component.

Figure 1: Community-Based Rehabilitation Matrix (World Health Organisation, 2010)



Current Status of CBR in the Asia-Pacific Region

The Asia-Pacific CBR Congress was founded and recognised by the WHO to manage CBR at the national and regional levels through the active participation of 37 countries as regional council members (CBR Asia-Pacific Network

Secretariat, 2014). Since the first Congress of the CBR initiative was held in 2009, momentum has grown across Asia to promote change through CBR. The number of participating countries has grown from 52 to 65, with over 600 participants. However, more work is needed to create systems that promote inclusion of people with disabilities, empowerment of communities, and those that are appropriate for the sustainability of programmes. The needs of people with disabilities must be recognised in order to promote a better quality of life and full access to their rights.

The purpose of this literature review is to build evidence to support strategies for broader implementation of CBR in LMICs of the Asia-Pacific region. The research questions are

1. In people with disabilities in developing low and middle-income countries in the Asia-Pacific region, does the implementation of community-based rehabilitation services improve physical health?
2. What are the barriers to implementing community-based rehabilitation initiatives in the Asia-Pacific region?

METHOD

The search for peer reviewed articles included multiple databases, including Cochrane Library, CINAHL, and PubMed. All the sources were international and published in English. The key words used were *community-based rehabilitation, CBR, physiotherapy, physical therapy, Asia, Pacific, education, health care, physical health, and quality of life.* The inclusion criteria were articles from 2010 to 2015, original research or systematic reviews, and focussed on the Asia-Pacific region. The exclusion criteria were articles written prior to 2010 and articles that included populations outside the Asia-Pacific region. An effort was made to narrow results to studies with adequate sample sizes to enhance the impact of this review.

The final selection of articles included one systematic review, one literature review, six quantitative research articles, one mixed methods research article, three qualitative research articles, and one editorial. Critical appraisals were completed for the 13 included articles to evaluate credibility based on validity, reliability, and applicability to the research questions. The Critical Appraisal Skills Programme (CASP) was used to guide the appraisal process and Sackett's Level of Evidence was used to establish levels of evidence (See Appendix A; Glaros, 2003; Critical Appraisal Skills Programme, 2013).

RESULTS and DISCUSSION

Four themes emerged from these articles in response to the research questions.

Improved Quality of Life and Access

Multiple studies examined the effect of CBR for underprivileged people with disabilities on quality of life at individual, family and community levels. Quality of life, specifically physical health and functional independence, is improved under CBR guided programmes and interventions(Magallona and Datangel, 2011; Balasubramanian et al, 2012; Mol et al, 2014; Iemmi et al, 2015; Mauro et al, 2015).The impact of CBR programmes in communities and villages demonstrates significant effect on the well-being of both individuals and entire villages by modifying attitudes, fighting prejudice and exclusion, and improving knowledge and skills (Magallona and Datangel, 2011; Mauro et al, 2015). Positive changes in the lives of the children with disabilities and their families, related to physical health, social participation and empowerment through independence, result from CBR (Mol et al, 2014).

The improved access to health and medical services in CBR programmes and interventions are important to promote better health and mobility (Nualnetr and Sakhornkhan, 2012; Mauro et al, 2014). Under CBR, improved access to pensions, use of assistive devices, access to home health, access to paid jobs and improved autonomy occur. The longevity of the CBR programme's effect remains significant even after seven years (Mauro et al, 2014). CBR's physical therapy services compare favourably with institutional or hospital-based physical therapy in promoting independence and quality of life. In part, this may occur from having better and easier access to physical therapy services without the burden of high cost and longer travel (Balasubramanian et al, 2012).

Impact of CBR on LMICs and Stakeholders

The impact of CBR on LMICs and the stakeholders demonstrated effectiveness in improving quality of life and enhancing the functioning of people with disabilities (Magallona and Datangel, 2011; Bowers et al, 2015; Iemmi et al, 2015). CBR also leads to perceived progress in activities of daily living and mobility, strengthened family relationships, a change in the attitudes toward people with disabilities, greater integration of people with disabilities, and increased self-esteem (Bowers et al, 2015). Stakeholders play an important role in collaborating

and implementing the rights of people with disabilities and the development of programmes necessary for community inclusion and development (World Health Organisation, 2010).

CBR programmes contribute to community development, engagement of healthcare professionals to the welfare of people with disabilities, and different government and non-government organisations supported community participation and collaboration to promote CBR and help in nation-building (Magallona and Datangel, 2011). Through CBR, individualised care caters to the specific needs of people with disabilities. This improves participation, a better understanding of diagnoses and treatment, and improved physical therapy regimen compliance (Magallona and Datangel, 2011; Deepak et al, 2013).

Barriers to CBR

Barriers to CBR programmes and interventions are present in many areas. These barriers include lack of understanding about CBR by professionals and CBR workers, decreased awareness, and physical- environmental, financial, and personal barriers (Lee et al, 2011; Morita et al, 2013; Van Hees et al, 2014). The major barriers to a successful CBR implementation are lack of teamwork and cooperation, along with misunderstanding the purpose of CBR (Lee et al, 2011; Morita et al, 2013). In addition, decreased awareness of CBR in public health centres (PHCs) and a lack of training create obstacles to better implementation of these programmes.

Physical-environmental barriers such as transportation, road conditions, and weather affect access to health care (Van Hees et al, 2014). Financial barriers include lack of resources to pay health care costs, difficulty in generating a consistent income, and familial socio-economic status. Personal barriers are primarily behavioural, such as individual attitudes toward having disability, low self-esteem, lack of motivation, and public acceptance and awareness about disabilities. It is important to recognise and anticipate these barriers in order to provide better CBR programmes that remain feasible regardless of any problems that might arise.

Relevance of CBR in the Asia-Pacific Region

CBR drives change in a community through effective programmes, and addresses issues of poverty, inequality, and health care services (Yuenwah et al, 2012). Seven

issues are common in the Asia-Pacific region and have an effect on shaping CBR programmes. These issues are:

- Poverty and hunger
- Inequalities
- Urbanisation
- Non-communicable diseases
- Disasters and climate change
- Demographic transition
- Economic challenges.

CBR impacts communities in LMICs in the Asia-Pacific region through projects focussing on poverty, inequality, lack of healthcare services, social isolation, lack of employment opportunities, and disempowerment of people with disabilities and families (Yuenwah et al, 2012). CBR in the Asia-Pacific region assists in building and continuing the growth of communities, especially in LMICs. Through workforce programmes, social empowerment, community and government mobilisation, advocacy, community engagement, and social inclusion, CBR can change the community to promote more sustainable services.

Limitations of the Study

The number of quality research articles available about CBR in LMICs is rather limited because emerging countries may not have access to resources to engage in CBR and conduct research. Sample populations are generally limited to urban areas since access to participants in rural provinces is difficult. Some of the articles were low in sample size but provided significant findings that supported the research questions.

CONCLUSION

The CBR approach includes community improvement and development, rehabilitation, equal opportunities, and community inclusion of people with disabilities (Deepak et al, 2012). This approach also fosters cooperation between all stakeholders, including people with disabilities, families, and concerned residents, to provide equal opportunities to people with disabilities. The CBR Matrix developed because less effective community efforts were happening in

smaller regions to provide an organisational framework for delivery (World Health Organisation, 2010).

CBR has helped improve the lives of people with disabilities and their families in LMICs in the Asia-Pacific region. The well-being of people with disabilities has been enhanced; moreover, there has been a change in attitudes, prejudice, and exclusion (Mauro et al, 2015). Access to medical services, assistive devices, paid jobs, and autonomy has improved physical function and, overall, the quality of life (Nualnetr and Sakhornkhan, 2012; Mauro et al, 2014).Indeed, CBR has a long-term positive effect on people with disabilities and is important to foster development in deprived communities.

CBR was a simple initiative pioneered by WHO. Currently, more than 30 countries are part of the Congress promoting CBR, decreasing poverty, and fighting for inclusion of persons with disability. Promoting and spreading CBR in LMICs is an important strategy for the realisation of the rights of people with disabilities. As nations in the Asia-Pacific and the entire world become more aware of their needs and rights as human beings, better quality of life and nation building will follow. The programmes along the guidelines of the CBR Matrix did not focus on just one component, as it is imperative to provide the necessary activities and foster holistic development and growth. Challenges remain in the implementation of CBR but these are small in comparison with the positive results.

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Appendix A: Evidence Table (Organised by Theme)

Author/Article/Citation	Topic	Sackett's Level of Evidence	Type of Article or Study/Method	Sample Size (n)	Brief Description
Mauro V, Biggeri M, & Grilli L (2015). Does community-based rehabilitation enhance the multidimensional well-being of deprived persons with disabilities? A multilevel impact evaluation. World Development; 76: 190-202.	Quality of life (Physical health and Functional independence)	2b	Quantitative Low-quality RCT	n = 2,540 (621 Control, 1,919 Treatment)	• Explored the impact of community-based rehabilitation programmes on the well-being of underprivileged people with disabilities from a multidimensional outlook through the use of multilevel analysis. • CBR programmes showed a significant effect on the well-being of both individuals and entire villages by modifying attitudes, and fighting prejudice and exclusion.
Mol TI, van Brakel W, Schreurs M (2014). Children with disability in Nepal: New hope through CBR?.Disability, CBR & Inclusive Development Journal; 25(1): 5-20.		3b	Qualitative Case-controlled Study	n =19	• Evaluated the impact of CBR programme on the quality of life of children with disabilities with the use of ranking line and semi-structured interviews. • Findings showed positive changes in the lives of the children with disabilities and their families.
Balasubramanian MM, Dhanesh KG, Amarnath A (2012). Functional independence and quality of life for persons with locomotor disabilities in institutional- based rehabilitation and community-based rehabilitation – A comparative study. Disability, CBR & Inclusive Development Journal; 23 (3): 150-155.		3b	Quantitative Case-controlled Study	n = 30 (15 Outpatient, 15 CBR)	• Findings showed no significant difference between outpatient physical therapy services when compared to CBR services with quality of life and functional independence.
Nualnetr N, Sakhornkhan A (2012). Improving accessibility to medical services for persons with disabilities in Thailand. Disability, CBR & Inclusive Development Journal; 23 (1): 34-49.	Access to medical/ rehabilitation services	3b	Quantitative Case-controlled Study	n = 99	• Assessed the improvement of accessibility to home health care and assistive devices for people with disabilities in rural communities. • Access to home health and assistive devices for people with disabilities was improved in rural communities.
Mauro V, Biggeri M, Deepak S, Trani JF (2014). The effectiveness of community-based rehabilitation programmes: An impact evaluation of a quasi-randomised trial. Journal of Epidemiology and Community Health; 68: 1102-1108.		2b	Quantitative Longitudinal Study	n = 2540 (1919 CBR, 621 control)	• Analysed the impact of CBR programmes in India, primarily access to rehabilitation services and the well-being of people with disability. • There was a positive and significant impact of the programmes such as access to services and upholding the rights and opportunities of people with disability.

Bowers B, Kuipers E, Dorsett P (2015). A 10-year literature review of the impact of community-based rehabilitation. Disability, CBR & Inclusive Development Journal; 26 (2): 104-119.	Impact of CBR to LMIC and stakeholders	3a	Literature Review	n = 7	• The articles that were included in this review are four quantitative and three qualitative. • Revealed increase in neurological improvement after stroke when clients had access to CBR, children with disabilities showed improved development and function, and there was increased access to assistive devices through CBR programmes.
Iemmi V, Gibson L, Blanchet K, Kumar KS, Rath S, Hartley S, Murthy GVS, Patel V, Weber J, Kuper H (2015). Community-based rehabilitation for people with disabilities in low- and middle-income countries: A systematic review. Campbell Systematic Reviews; 15: 1-178.		1a	Systematic Review	n = 15	• Assessed the efficacy and cost-effectiveness of CBR for people with disabilities, their families, and community in LMIC. • Most of the articles reviewed showed a fair consistency in the positive impact of CBR to people with disabilities and their families.
Magallona MLM, Datangel JP (2011). The community-based rehabilitation programme in the University of the Philippines Manila, College of Allied Medical Professions. Disability, CBR & Inclusive Development Journal; 22 (3): 39-61.		4	Mixed Method Case series	n = 292	• Explored the impact of CBR in communities in the Philippines. • Revealed CBR improved the quality of life of people with disabilities and contributed to community development.
Deepak S, Biggeri M, Mauro V, Kumar J, Griffo G (2013). Impact of community-based rehabilitation on persons with different disabilities. Disability, CBR & Inclusive Development Journal; 24(4): 5-23.		2b	Qualitative Cohort Study	n = 2,332 (1,918 CBR, 414 control)	• Considered the components of the CBR Matrix and grouped the participants based on diagnoses. • CBR programmes were beneficial in all the components of the CBR Matrix. People with physical disabilities appeared to benefit more.
Morita H, Yasuhara K, Ogawa R, Hatanaka H (2013). Factors impeding the advancement of community-based rehabilitation (CBR): Degree of understanding of professionals about CBR. Journal of Physical Therapy Science; 25 (4): 413-423.	Barriers to CBR	3b	Quantitative Cohort Study	n = 440	• Evaluated the understanding of CBR professionals about basic CBR concepts. • Most professionals working in CBR, in both rural and urban areas in Japan, did not know the real meaning of CBR. Also, it showed there were different ideas about what services were included in CBR.

Van Hees S, Cornielje H, Wagel P, Veldman E (2014). Disability inclusion in primary health care in the Nepal: An explorative study of perceived barriers to access governmental health services. Disability, CBR & Inclusive Development Journal; 25 (4): 99-118.		3b	Qualitative Case-controlled Study	n = 21 (10 primary healthcare providers, 11 people with disabilities)	• Investigated the different barriers that people with disabilities and their families face to access primary health care services. • Aside from physical barriers, numerous environmental, financial, and personal barriers can also affect access to health care.
Lee HS, Jong SC, Yong YK, Young-Jin C (2011). Awareness of community-based rehabilitation with a focus of public health centres. Journal of Physical Therapy Science; 23: 909-913.		2b	Quantitative Low-quality RCT	n = 184	• Assessed the awareness of people with disabilities about CBR, focussed on the public health centres (PHCs). • Low awareness of CBR in PHCs considering the need, high need for rehabilitation services.
Yuenwah S (2012). Relevance of CBR for the Asia-Pacific region. Disability, CBR & Inclusive Development Journal; 23 (1): 7-13.	Relevance of CBR in the Asia-Pacific region	5	Expert Opinion Editorial	none	• CBR drives community to change through the programmes that address issues of poverty, inequalities, and health care services.

Appendix B: Statistical Significance Table

Themes	Authors/Articles	Outcome Variables	Analyses	Significance/Findings
Quality of life (Physical health and Functional independence)	Balasubramanian et al (2012)	Compared functional independence and quality of life of persons with locomotor disabilities in community-based rehabilitation and institution- based rehabilitation.	t-test: • Functional Independence Measurement (FIM) • Quality of life	• t = -1.810 • t = 0.468
	Mauro et al (2015)	Impact of community-based rehabilitation (CBR) programmes on the well-being of underprivileged people with disabilities from a multidimensional outlook through the use of multilevel analysis.	Logit model and t-test • four years • seven years	• p< .001 • p< .001
	Mol et al(2014)	Impact of CBR programmes to the quality of life of children with disabilities and their families.	Content analysis	68.4% of the participants experienced positive impact to the quality of life including their families
Access to medical/ rehabilitation services	Mauro et al (2014)	Impact of CBR to access to pension, use of assistive device, access to paid jobs, and improved autonomy from a four-year to seven-year period.	Statistical analysis not mentioned.	Access to pension • p < .001 (4 years) • p < .001 (7 years) Use of assistive device • p < .001 (4 years) • p < .005 (7 years) Access to paid jobs • p < .001 (4 years) • p < .001 (7 years) Improved autonomy • p < .001 (4 years) • p < .001 (7 years)
	Nualnetr & Sakhornkhan (2012)	• Develop action plan for improved access to home health care and assistive devices for persons with disabilities. • Evaluate the changes to the number of people with disabilities that can access home health care and assistive devices after the implementation of the plan.	Chi-square test	Improved access to home health care • p < 0.01 Decreased in people with disabilities not receiving assistive device • p < 0.01
Impact of CBR to LMIC and stakeholders	Bowers et al (2015)	Impact of CBR to LMIC	Critical appraisal	• Improved function, access to health care services, and assistive devices. • Revealed that CBR led to perceived progress in activities of daily living and mobility, strengthened family relationships, a change in the attitudes towards people with disabilities, greater integration of people with disabilities, and increased self-esteem. • More research for education and livelihood aspects of the CBR Matrix

	Deepak et al (2013)	Impact of CBR to different types of disabilities through the use of the CBR Matrix	Fisher test, two-tailed	People with physical disabilities: • health (p< .03) • education (p< .0001) • livelihood (p< .0001) • social participation and empowerment (p< .0001).
	Iemmi et al (2015)	Impact of CBR to people with disabilities and their careers in LMIC	Critical appraisal	• CBR is effective in improving the quality of life and enhancing the function of people with disabilities in LMIC
	Magallona & Datangel (2011)	Impact of CBR programmes on the stakeholders	Content analysis	• Knowledge, attitude, and skills were improved in 91.8% of participants • Clinical improvement also occurred in 88% of participants engaged in CBR • Improved understanding of diagnoses and increased compliance (94%) with physical therapy regimens • PT students had an improved attitude (71%) towards community service • CBR professionals appreciated the impact of CBR clients and their families (54%) • CBR programmes should be replicated nationwide suggested by (93%) interns and supervisors • Governmental and nongovernmental organisations supported (100%) community participation and collaboration to promote CBR
	Lee et al (2011)	Awareness of CBR in public health centres (PHCs)	Logistic regression analysis	• Most of the participants were not aware of CBR (78.6%) • About 50% of the participants have not visited PHCs • Participants used hospitals and clinics for physical therapy services and PHCs were the least used (3.9%)

	Morita et al (2013)	Evaluated the understanding of CBR professionals about basic CBR concepts	Categorical principal component analysis	• Most professionals working in CBR, in both rural and urban areas did not know the real meaning of CBR • A lack in teamwork and cooperation, a lack of understanding of the function of CBR, uninformed personnel, and a lack of training were the major barriers to successful CBR implementation
	Van Hees (2014)	Investigated the different barriers that people with disabilities face to access primary health care services	Content analysis	• Physical-environmental barriers like transportation, road conditions, and weather affect access to health care • Financial barriers are lack of resources to pay health care costs, difficulty in generating a consistent income, and familial socio-economic status • Personal barriers were mostly behavioural, such as attitude towards having disability, low self-esteem, lack of motivation, and public acceptance and awareness about disabilities
Relevance of CBR in the Asia-Pacific region	Yuenwah	Reviewed how CBR drives community to change through the programmes that address issues of poverty, inequalities, and health care services	N/A	• The seven issues that were common in the Asia-Pacific region and its effects on shaping CBR programmes were poverty and hunger, inequalities, urbanisation, non-communicable diseases, disasters and climate change, demographic transition, and economic challenges. • CBR in the Asia-Pacific region helped in building and continuing the growth of communities, especially in LMICs.