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Review Article

Assessing the Utility of Primary Health Care Indicator-Activities in the Context of Low-and Middle-Income Countries: A Document Analysis

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Abstract

Introduction: Community Health Worker Programs (CHWPs) have the potential to contribute to global health goals if their activities are aligned with the principles of Primary Health Care (PHC). The limited research and advice on how the PHC principles can be applied by the CHWPs in low-and middle-income countries highlights the need for a set of Indicator-Activities that can guide the application of these principles by CHWPs. A recent study identified a core set of 29 PHC Indicator-Activities, which could be used by CHWPs to guide their application of PHC principles. The aim of this study is to assess the utility of those Indicator-Activities. **Methods:** A desk review using 'READ' approach was conducted of publicly available documents of two CHWPs, namely the National Program for Family Planning and Primary Health Care commonly known as Lady Health Worker Program of Pakistan and the National Health Extension Program of Ethiopia. The documents collated consisted of programmatic materials such as evaluation reports, case studies, policy briefs, planning documents and working papers produced outside of formal publication channels. **Results:** In total, 20 documents were reviewed. Overall, out of 29 Indicator-Activities, strong evidence was available for 22 Indicator-Activities in both CHWPs; partial evidence was observed for four activities and there was no evidence for two Indicator Activities across both CHWPs reviewed in this study. One activity was found to be overlapping with the Indicator-Activity of 'joint ownership and design of the CHWP' so it was merged with it. **Conclusion:** Findings confirm that the PHC Indicator-Activities identified are likely to be applicable to the CHWPs in low-and middle-income countries. These indicators can be used to assess the application of PHC principles, which can inform CHWP designing and monitoring in the context of low-and middle-income countries. Future research may focus on assessing the Indicator-Activities in the field and applying them on a broad range of CHWPs.

Keywords: Indicator-Activities; Primary Health Care Principles; Document Analysis; Community Health Worker Programs

Introduction

Primary Health Care (PHC) has remained a key approach for more than four decades to strengthen the health system and improve access to locally relevant essential health services for all [1] PHC as an approach to organize healthcare was agreed upon by the member states at the World Health Assembly in 1977 and the subsequent international conference in 1978 on PHC held in Alma Ata with the slogan of "Health for All" [2]. Most recent discourse such as the 2018 Astana Declaration has also reaffirmed the significance of PHC and its principles to strengthen health systems and achieve health-related Sustainable Development Goals (SDGs) [3]. As an approach to health system development, PHC has demonstrated links to better health outcomes, improved equity and increased

health security [4-8].

Community Health Worker Programs (CHWPs) are an important 'community-centered' health systems strengthening strategy that supports the uptake of the PHC approach [7,9,10]. In Low-and Middle-Income Countries (LMICs) in particular, many CHWPs have been implemented as part of the PHC approach to enhance access to essential health care services close to community and as a means to achieve "Health for All" [11-13]. The 2015 SDGs recommended the expansion and institutionalization of CHWPs by national governments to achieve these updated goals [14]. This recommendation further enhanced the global interest in CHWPs as a strategy to increase access to basic health services, and to strengthen health systems [14-16].

CHWPs range from small-scale programs, which often implement specific interventions over a short period of time, through to large-scale programs implemented by non-government organizations to national level government-sponsored CHWPs [17,18]. Regardless of the size of the CHWPs, to be effective they need to incorporate PHC principles, including community participation, Universal Health Coverage (UHC), intersectoral collaboration and appropriateness and align their design, implementation and evaluation activities with those principles [5,19-22].

Considering the importance of CHWPs to strengthen health systems, there are a number of frameworks and indicators available to assess their performance [16]. Examples include the Community Health Worker (CHW) Common Indicators Project (CIP), CHW Assessment and Improvement Matrix (AIM) toolkit, Accompanimeter 1.0' tool, 5-SPICE framework and Primary Health Care Performance Initiative (PHCPI) and WHO guideline on health policy and system support to optimize CHWPs [16,23-28]. These frameworks and indicators focus mainly on national level governance, strategies and funding and local level functionality and processes i.e. how to implement and monitor CHWPs. However, these frameworks do not explicitly assess the application of PHC principles in CHWPs.

A recent study identified a core set of indicators which provides a potential guide for application of PHC principles in CHWPs [29]. This set of indicators defines 29 activities which point to if a CHWP is aligned with PHC principles (Table 1). However, these indicators have not been tested or piloted on CHWPs. The aim of this study is to assess the utility of those Indicator-Activities in national CHWPs and to refine the indicator descriptors.

Primary Health Care Principles and sub-attributes	**Indicator-Activities**
Universal Health Coverage	Service Provision
	Selection and placement of CHWs
	Defined catchment area
	Community Sensitization
	Needs assessment
Equity	Planning
	Implementation
	Address financial and geographic barriers to health care
Access	Identification of the causes of low demand and utilization
	Promote community access to the program
	Ensure privacy and confidentiality
Comprehensiveness	Provision of health services along the spectrum of preventive, curative, and rehabilitative services
	Linkages with secondary and tertiary level services
Community Participation	Joint ownership and design of CHWPs
	Availability of health data to the community

Primary Health Care Principles and sub-attributes	**Indicator-Activities**
Intersectoral Coordination	Representation of non-health organisations on planning and governance structures of CHWPs
	Public private partnership
Appropriateness	Context specific program design and implementation
	Evidence-based interventions
Effectiveness	Monitoring health outcomes
	Monitoring performance
	Well-resourced CHWs
Cultural acceptability	Community involvement in the selection of the CHWs
	Health Literacy
Affordability	Cost effective interventions
	Identify and address financial barriers to health care
Manageability	Adequate human resources
	Proportionate service provision
	Continuous adjustment of the role of CHWs as the program evolves with respect to communities' needs
CHWs: Community Health Workers, CHWP: Community Health Worker Program	

Table 1: Indicator-activities from Delphi exercise to apply primary health care principles in community health worker programs.

Materials and Methods

Study Design

A systematic qualitative document analysis was conducted to assess the utility of PHC Indicator-Activities developed recently using Delphi method [29].

Study Setting

The study included two national level CHWPs from Ethiopia and Pakistan. The formal name of Ethiopian CHWP is National "Health Extension Program" and Pakistan's CHWP is "National Program for Family Planning and Primary Health Care", commonly known as the "Lady Health Worker Program". The selection criteria for choosing these CHWPs included, (i) national coverage (ii) CHWPs as part of the well-established health infrastructure, (iii) contribution towards improvements in health outcomes such as maternal and child health, immunization, family planning and communicable diseases [30-33] and (iv) availability of documents informing planning, implementation and evaluation of these programs. The two CHWPs have been implemented differently; Pakistan's program administration is devolved to provincial levels, whereas Ethiopian program is managed centrally at the national level.

Health Extension Program (HEP) of Ethiopia: This flagship program of the Government of Ethiopia, was launched by the Federal Ministry of Health in 2003 [34]. HEP aimed to improve access to healthcare services in rural areas in order to improve health outcomes by targeting households and communities [35]. The program focuses on health promotion, disease prevention including immunization, provision of family planning services, treatment of selected illnesses, documentation of community health status and mobilization of the community for health campaigns. The program also provides ongoing support to people with a chronic illness such as HIV/AIDS [36,37]. The HEP provides health services at the household, community and Health Post levels. CHWs are deployed in pairs, two for every village serving a population of 3000 to 5000 people and affiliated with each village's health post [37].

Pakistan's National Program for Family Planning and Primary Health Care (NPFPPHC): In 1994, Pakistan's Ministry of Health launched its CHWP as part of a national strategy to improve

health by bringing health services to the doorsteps of underserved communities. The program has been running for 24 years and during this time undergone various administrative changes ranging from federal management to post-devolution provincial management and regularization of CHWs as government employees. The program has a major role in the provision of primary care services and in the reduction of burden of disease via preventive strategies and health education for communities, especially in the rural areas [38]. The prime role of this program is to provide basic primary care services to the communities and organize community by developing women groups and health committees. Each CHW is responsible for approximately 1,000 people within a catchment area of 200 houses [39].

Data collection and analysis

Document analysis of the two CHWPs was conducted using publicly available documents since the inception of the CHWPs. We used READ approach as a stepwise guide for systematic and thorough review of documents [40]. The steps of this approach are (i) ready your materials, (ii) extract data, (iii) analyze data and (iv) distill the findings [40]. For the first step, all the relevant material was collected via searching grey literature using Google Search and by contacting CHWP officials in Pakistan and Ethiopia. The search terms consisted of programs, reports, case studies, evaluation, guidelines and planning documents combined with the name of each of the two CHWPs and countries included in the document analysis. Our search strategy was designed to be broad to minimize the possibility of missing relevant documents and included all types of descriptive, explanatory and evaluation evidence. The search was conducted during January and February 2022. The documents collated consisted of programmatic materials such as case studies, policy briefs, planning documents, evaluation reports and working papers produced outside of formal publication channels. The documents were then categorized based on their focus as either planning, implementation or evaluation. This document analysis did not include any peer-reviewed published articles as there has been a recent scoping review on published literature which informed that the application of PHC principles in national CHWPs is not uniform and in-depth review of program documents may provide more insights [29]. The second step consisted of data extraction into a Microsoft Excel spreadsheet where each row was a document and each column was the category of information such as document title, type of the document, author and date and evidence for each of the PHC Indicator-Activities. The data extraction form is provided as Appendix 1. As the third step, we followed a thematic content analysis approach for qualitative synthesis of information extracted from the documents [41]. The themes were developed apriori from the PHC principles and Indicator-Activities. The thematic content analysis approach is most appropriate to apply on descriptive data from program/project documents for aggregate synthesis of information [41]. The level of evidence found for an Indicator-Activity in a CHWP was classified as 'evidence available' if it was found across two or more types of documents (planning, implementation or evaluation) of a CHWP. 'Partial evidence available' reflected that the information was found only in one type of document in a CHWP. 'No evidence available' means there was no information found in any type of document reviewed for that program in relation to an Indicator-Activity. The document review was continued until all available documents had been reviewed. At the fourth and last step of READ approach, the distillation process led to the synthesis of findings in tabular and narrative form, reported in the results section of this paper. The overall understanding about the utility of each particular PHC Indicator-Activity was developed by considering the collective evidence from the two CHWPs and classified as 'overall level of evidence' (Table 2).

Overall level of evidence	CHWP 1	CHWP 2
Strong evidence	Evidence available	Evidence available
	Evidence available	Partial evidence
Partial evidence	Partial evidence	Partial evidence
	Partial evidence	No evidence
No Evidence	No evidence	No evidence
CHWP: Community Health Worker Program		

Table 2: Classification of overall level of evidence for Indicator-Activities.

Results

In total, 20 documents were reviewed from both CHWPs. List of documents included in this analysis is provided as Appendix 2. The 'overall level of evidence' was strong for 22 of 29 Indicator-Activities, partial for four activities, while no evidence was found for two Indicator-Activities. The level of evidence found for each Indicator-Activity in and across the two CHWPs is presented in Table 3. Details of the evidence found in the documents for each Indicator-Activity is shown in Table 4. The 'overall level of evidence' is summarised in the following paragraphs.

PHC principles and sub-attributes	Indicator-Activities	Evidence in HEP of Ethiopia	Source of evidence	Evidence in NPFPPHC of Pakistan	Source of evidence	Overall level of evidence for the Indicator-Activity across the two CHWPs
UNIVERSAL HEALTH COVERAGE	Service Provision	Evidence available	Planning, implementation and evaluation	Evidence available	Planning, implementation and evaluation	Strong Evidence
	Defined catchment area	Evidence available	Planning, Implementation and evaluation	Evidence available	Planning, implementation and evaluation	Strong Evidence
	Selection and placement of CHWs	Evidence available	Planning, implementation and evaluation	Evidence available	Planning, implementation and evaluation	Strong Evidence
	Community Sensitization	*Partial evidence available*	Evaluation	Evidence available	Planning and implementation	Strong Evidence
	Needs assessment	Evidence available	Planning and implementation	*Partial evidence available*	Evaluation	Strong Evidence

PHC principles and sub-attributes	Indicator-Activities	Evidence in HEP of Ethiopia	Source of evidence	Evidence in NPFPPHC of Pakistan	Source of evidence	Overall level of evidence for the Indicator-Activity across the two CHWPs
Equity	Planning	Evidence available	Planning	Evidence available	Planning and evaluation	Strong Evidence
	Implementation	Evidence available	Implementation	Evidence available	Implementation and evaluation	Strong Evidence
	Address financial and geographic barriers to health care	Evidence available	Planning, implementation and evaluation	Evidence available	Planning, implementation and evaluation	Strong Evidence
Access	Identification of the causes of low demand and utilization	Evidence available	Implementation and evaluation	*Partial evidence available*	Planning	Strong Evidence
	Promote community access to the program	Evidence available	Planning, implementation and evaluation	Evidence available	Planning and implementation	Strong Evidence
	Ensure privacy and confidentiality	No evidence available	_	No evidence available	_	No Evidence
Comprehensiveness	Provision of health services along the spectrum of preventive, curative, and rehabilitative services	Evidence available	Planning, implementation and evaluation	Evidence available	Planning, implementation and evaluation	Strong Evidence
	Linkages with secondary and tertiary level services	Evidence available	Planning and implementation	Evidence available	Planning and implementation	Strong Evidence
Community Participation	Joint ownership and design of community health worker programs	Evidence available	Planning, implementation and evaluation	Evidence available	Planning, implementation and evaluation	Strong Evidence
	Availability of health data to the community	*Overlaps with the Indicator-Activities of joint ownership and design of the CHWP and effectiveness.*				

PHC principles and sub-attributes	Indicator-Activities	Evidence in HEP of Ethiopia	Source of evidence	Evidence in NPFPPHC of Pakistan	Source of evidence	Overall level of evidence for the Indicator-Activity across the two CHWPs
Intersectoral Coordination	Representation of non-health organisations on planning and governance structures of CHWPs	Evidence available	Planning and implementation	Evidence available	Planning and evaluation	Strong Evidence
	Public private partnership	Evidence available	Implementation and evaluation	*Partial evidence available*	Planning	Strong Evidence
Appropriateness	Context specific program design and implementation	Evidence available	Implementation and evaluation	*Partial evidence available*	Evaluation	Strong Evidence
	Evidence-based interventions	Evidence available	Planning and evaluation	*Partial evidence available*	Planning	Strong Evidence
Effectiveness	Monitoring health outcomes	Evidence available	Planning, implementation and evaluation	Evidence available	Planning, implementation and evaluation	Strong Evidence
	Monitoring performance of CHWs	Evidence available	Planning, implementation and evaluation	*Partial evidence available*	Evaluation	Strong Evidence
	Well-resourced CHWs	Evidence available	Planning, implementation and evaluation	Evidence available	Planning, implementation and evaluation	Strong Evidence
Cultural acceptability	Community involvement in the selection of the CHWs	Evidence available	Implementation and evaluation	Evidence available	Implementation and evaluation	Strong Evidence
	Health Literacy	No evidence available	_	No Evidence available	_	No Evidence

PHC principles and sub-attributes	Indicator-Activities	Evidence in HEP of Ethiopia	Source of evidence	Evidence in NPFPPHC of Pakistan	Source of evidence	Overall level of evidence for the Indicator-Activity across the two CHWPs
Affordability	Cost effective interventions	*Partial evidence available*	Planning	No Evidence available	_	Partial Evidence
	Identify and address financial barriers to health care	*Partial evidence available*	Planning	No evidence available	_	Partial Evidence
Manageability	Adequate human resources	Evidence available	Planning implementation and evaluation	Evidence available	Planning implementation and evaluation	Strong Evidence
	Proportionate service provision	*Partial evidence available*	Implementation	*Partial evidence available*	Evaluation	Partial Evidence
	CHWs role adjustment: *Continuous adjustment of the role of CHWs as the program evolves with respect to communities' needs*	*Partial evidence available*	Evaluation	*Partial evidence available*	Evaluation	Partial Evidence
CHWs: Community Health Workers; HEP: Health Extension Program; NPFPPHC: National Program for Family Planning and Primary Health Care						

Table 3: Summary of evidence for primary health care Indicator-Activities in the two community health worker programs.

PHC Principles and sub attributes	Indicator-Activity	Example of the evidence from the available documents of community health worker programs	
		Health Extension Program of Ethiopia	National Program for Family Planning and Primary Health Care of Pakistan
Universal Health Coverage	Service Provision	Outreach and at the health post service provision including health promotion, disease prevention, family planning and mental health services, diagnosis and treatment of uncomplicated, common illnesses including malaria, pneumonia, diarrhoea, and malnutrition in the community and documentation of community health status. Referral of severe cases.	Provision of health promotion, prevention and curative services. Basic maternal and child health services that they provide include reproductive health education, promotion of healthy behaviours, family planning, HIV/AIDS care. CHWs provide regular treatment for diarrhoea, malaria, acute respiratory tract infections, and intestinal worms, and contraceptives as part of family planning.
	Defined catchment area	Two CHWs are deployed for each health post serving 3,000 to 5,000 population. Each kebele (village) has two CHWs, so that at any given moment one is present in the community and one at the health post.	Each CHW is responsible for approximately 1000 people within a catchment area of 200 houses.
	Selection and placement of CHWs	Nationally agreed criteria for selection of CHWs: residence in the village, capacity to speak local language, graduation from 10th grade, and willingness to remain in the village and serve communities.	Criteria for selection of CHWs includes a literacy threshold of a minimum of 8 years of education, between 18 and 50 years old, reside in, be accepted by, and be recommended by the communities they serve.
	Community Sensitization	The community's awareness about available CHWP service packages was only 58.8% in 2019.	Communities being served by the CHWs have a reasonably high awareness of family planning and where to obtain family planning methods.
Equity	Needs assessment	After analysis of the socioeconomic, cultural, and environmental diversities of the Ethiopian population, three versions of the CHWP were designed and implemented to suit agrarian, pastoralist and the urban population.	CHWP facilitates pro-poor access to health in some provinces whereas in other, the program appears targeted heavily at higher wealth quintiles, suggesting strongly that the programme is not being targeted at the most vulnerable or marginalised groups.

PHC Principles and sub attributes	**Indicator-Activity**	**Example of the evidence from the available documents of community health worker programs**	
		Health Extension Program of Ethiopia	National Program for Family Planning and Primary Health Care of Pakistan
	Equity-based planning and implementation	Planning strategy 2020-2035: CHWP service packages will be expanded to align interventions with changes in disease epidemiology and to meet the needs and expectations of communities. Evaluation 2019: The CHWP packages are relevant in addressing the current health needs of the rural community.	The CHWP provides more services to low income and poor households than any alternative service provider in the public sector. However there is certainly scope to further increase the level and quality of services and to increase coverage to the underserved and to the poor. There appear to be no mechanisms to ensure that CHWs ask women about their family planning needs or to ensure women for long term or permanent methods. The limited time spent on family planning, the few women seen per week and the level of stock-outs are likely to have contributed to the limited progress the program has made during the past decade in family planning.
	Address financial and geographic barriers to health care	- During 2020-2035, construction of health posts for communities with sedentary lifestyles will be supplemented by expansion of mobile health services for communities with semi-sedentary and mobile lifestyle. - Women receive care from nearby health posts or the associated CHWs; since the inception of the CHWP, the proportion of health posts that are capable of providing antenatal care has increased to 83%.	CHWs provide family planning and PHC services to rural areas and urban slums at the doorstep of the community. The incomplete and unsystematic geographic coverage of the programme means that significant numbers of high priority areas are not served in all regions of Pakistan.

PHC Principles and sub attributes	**Indicator-Activity**	**Example of the evidence from the available documents of community health worker programs**	
		Health Extension Program of Ethiopia	National Program for Family Planning and Primary Health Care of Pakistan
Access	Identification of the causes of low demand and utilization	The absence of curative services has been the source of dissatisfaction, and limit the acceptance of services provided at HPs as evidenced by bypassing HPs to visit higher level health facilities, for services that can be provided at HP level. Delivery services were the most recommended by women to be included as part of CHWP packages in addition to the demand for treatment of sick adults and children.	Research on effective utilization of CHWs was part of planning in 2016.
	Promote community access to the program	Health posts are almost universally available in Ethiopia. A substantial number of health posts (35%), however, have access to roads that function only during dry seasons, and 6% of HPs have no access to a paved road connecting them to the referral health centres.	CHWs facilitate timely access to services being residing in the same community. They work directly out of their homes which are commonly called "health houses".
	Ensure privacy and confidentiality	*lack of evidence noted*	*lack of evidence noted*
Comprehensiveness	Provision of health services along the spectrum of preventive, curative, and rehabilitative services	CHWs provide promotive, preventive and selected curative health services to the community of their origin. The services are categorised into four major programmatic areas including non-communicable diseases and mental health services: (i) family health, (ii) disease prevention and control, (ii) hygiene and environmental sanitation, and (iv) health education and communication.	CHWs provide preventive, promotive and deliver some of the basic curative care in their communities as mentioned under service provision.
	Linkages with secondary and tertiary level services	There are clear national policies and guidelines for supervision, referral and linkage with the formal health care delivery system, which carries out regular supervision. Referral care is good since most health centres have an ambulance that can come out to the health post or to a village to transport mothers in labor and emergency cases to the health center or the primary hospital.	CHW acts as liaison between formal health system and her community as well as ensure coordinated support from NGOs and other departments. She coordinates with local TBAs/midwives or other skilled birth attendants and local health facilities for appropriate antenatal, natal and postnatal services.

PHC Principles and sub attributes	**Indicator-Activity**	**Example of the evidence from the available documents of community health worker programs**	
		Health Extension Program of Ethiopia	National Program for Family Planning and Primary Health Care of Pakistan
Community Participation	Joint ownership and design of CHWPs	In the operationalization of the CHWP, community engagement and ownership is realized through participation in and contribution to the resourcing of the CHWP, the selection of candidates for CHW, the M&E of the CHWP services and CHWs themselves and participation in the governance of the health services.	CHWs are expected to establish a village health committee for men and women in order to organize community to participate in health promotion activities (e.g. family planning, immunization, improved sanitation and nutrition etc.). CHWs also provide a range of community development services and participate in community meetings.
Intersectoral Coordination	Representation of non-health organisations on planning and governance structures of CHWPs	The Ministries of Health and Education collaborated to implement the cycles of recruiting, training, and deployment of CHWs. The Ministry of Health also worked with the subnational health authorities to ensure that the HEWs receive practical training in health centres under the supervision of health workers. The subnational finance bureaus have routed salaries to the deployed CHWs through the payroll system for regular employees.	Significant coordination problems were noted in all the regions except one. In the regions where the CHWP remained a standalone programme, and had not been integrated, government stakeholders consistently reported a lack of mechanisms for coordination between key stakeholders, in particular the Health Department, the Population Welfare Department, and the People's Primary Healthcare Initiative.
	Public private partnership	Development partners have aligned around the national health strategy during CHWP implementation. Significant resources have been channelled from the partners to pay for medical equipment, drugs, supplies, and pre- and in-service training and teaching materials. These partners have also contributed technically and financially to the distribution of commodities and continuous evaluation of CHWP to provide evidence for improving program implementation.	2010 planning commission form intends to partner with non-government organisations and community-based organisations in the selected areas to mutually benefit from experience and resources of each other to promote strategies for sharing all resources available at the grass roots level.

PHC Principles and sub attributes	**Indicator-Activity**	**Example of the evidence from the available documents of community health worker programs**	
		Health Extension Program of Ethiopia	National Program for Family Planning and Primary Health Care of Pakistan
Appropriateness	Context specific program design and implementation	Upon deployment, CHWs assess the village to understand the context, resources, population structure, and priority health problems. They select "model families" in collaboration with the village administration. CHWs train these families for 96 hours. The training is not limited to theoretical aspects of health promotion and disease prevention: criteria for certification of a household include visible changes in behaviour, for example, owning and using a latrine, proper hand washing, completing immunization schedules by eligible mothers and children, and the accessing of antenatal care by pregnant mothers.	Where the CHWP is operating, it does generally address the needs of marginalised and vulnerable women and children. However, the extent to which it does is compromised across all regions by: (i) the lack of an explicit focus on geographical areas and socio-economic groups with the greatest need; (ii) an increasing focus on immunisation relative to other health, health education, and nutrition needs; and (iii) management and resourcing problems.
	Evidence-based interventions	The design of the package of CHW-provided health interventions was based on an analysis of major disease burdens for most of the population. Based on the rise in non-communicable diseases, NCD prevention and other priority communicable and neglected tropical diseases were recently incorporated in the CHWP.	2016 planning strategy includes research on issues such as; malnutrition, effective utilization of MNCH services, anemia, newborn care, CMWs, LHWs services and utilization, etc. to aid in evidence-based decision making, policy formulation, planning and consequent advocacy.

PHC Principles and sub attributes	**Indicator-Activity**	**Example of the evidence from the available documents of community health worker programs**	
		Health Extension Program of Ethiopia	National Program for Family Planning and Primary Health Care of Pakistan
Effectiveness	Monitoring health outcomes	To improve the continuous monitoring and evaluation of CHWP and measure its impact over time, the FMOH designed a community health information system (CHIS) that includes a central family folder. This folder is retained at the health post and is a medical record of an entire household in relation to the CHWP package of interventions. Further strengthening and digitalisation of CHIS is included in the 2020-2035 planning of the CHWP.	The CHWP has a Management Information System (MIS) that informs quarterly review meetings and provides analytical feedback on CHWs' health records. The MIS records and transmits all CHW PHC activities to the district, Provincial, and federal management levels. This allows CHWs to keep track of the health status and needs of their catchment population and informs performance evaluation processes. Inadequate integration of the MIS into the national health system is a challenge though.
	Monitoring performance	The CHWs are accountable to and supervised by environmental health professionals and public health nurses. CHWs attend integrated refresher training (IRT) to address the skill and knowledge gaps identified during supervisory visit.	CHWs knowledge assessment is done routinely by their supervisors using score cards. There is a need for re-emphasizing information about family planning commodities and side effects management in CHWs training was highlighted. These low levels of knowledge happen against the backdrop where CHWs don't counsel for side effects or contraindications, thus compounding the problem of appropriate use of contraceptives by their clients or what happens if their clients encounter side effects. No evidence on skills assessment of CHWs was observed.
	Well-resourced CHWs	- All selected CHWs receive one year of didactic and practical training in 16 health care packages. Through regular evaluation of their performance and identification of gaps, CHWs receive in-service training to strengthen their capacity. - Stockouts of drugs for long periods of time have been common. - CHWs are mainly supervised and supported by the health center staff, with whom they work closely.	- The training of CHWs are conducted in two phases for a total of fifteen months using program training manuals and curriculum. - The 2019 evaluation reports consistent issues with the CHWP logistics management system which have resulted in significant gaps in the provision of basic supplies and equipment leaving CHWs seriously under-supplied with drugs and contraceptives - CHWs' supervision takes place in the community at least once a month, at which time the CHW supervisor meet with clients and with the CHW, review the CHWs' work using a standardized designed checklist, and make a work plan for the next month.

PHC Principles and sub attributes	**Indicator-Activity**	**Example of the evidence from the available documents of community health worker programs**	
		Health Extension Program of Ethiopia	National Program for Family Planning and Primary Health Care of Pakistan
Cultural acceptability	Community involvement in the selection of the CHWs	CHWs are selected by the community in which they live (in collaboration with village administration). In the household survey, over 70% of respondents, confirmed that the CHWP is accepted by the community and that the community trust the CHWs, and consider them as a model for good behaviour.	The selection committee of a CHW includes a medical officer of the area (chair), a female medical officer, a lady health visitor, a dispenser and a community member (all from the same community for which the CHW is being selected).
	Health Literacy	*lack of evidence noted*	*lack of evidence noted*
Affordability	Cost effective interventions	The Ethiopian CHWP intends to introduce earmarked budget for the CHWP at all levels and enhanced resource mobilization from nongovernment sources in order to make the CHWP cost-effective and affordable for the community.	*lack of evidence noted*
	Identify and address financial barriers to health care	The CHWP plans to ensure sustainable funding and eliminating financial hardship from the CHWP services by prioritizing government spending at primary health care unit level and covering the cost of curative health services at health posts through user fee and community-based health insurance.	*lack of evidence noted*

PHC Principles and sub attributes	**Indicator-Activity**	**Example of the evidence from the available documents of community health worker programs**	
		Health Extension Program of Ethiopia	National Program for Family Planning and Primary Health Care of Pakistan
Manageability	Adequate human resources	In 2019, there were 39,878 CHWs staffing 17,587 health posts throughout the country as per the projected estimates. Currently, on average 2.4 CHWs are available per health post, and 87% health posts meet the minimum requirement of 2 CHWs per health post.	All regions of Pakistan have encountered significant human resource problems post-devolution.
	Proportionate service provision	Once deployed to their respective communities, CHWs divide their time between providing services at health posts and undertaking community promotion programs at household level.	In response to shortage of human resources, all provinces have increased the caseload of CHWs from a maximum of a population of 1,000 residents to 1,500, though this was done without a full consideration of the ability of an LHW to provide the same level of service to a larger population. Moreover, there has been a significant expansion in the expectation of the involvement of LHWs in programming that is outside her core responsibilities – in particular, involvement in polio campaigns – although LHWs are often expected to be involved in other campaigns, such as relating to dengue or malaria.
	Continuous adjustment of the role of CHWs as the program evolves with respect to communities' needs	Currently, Ethiopian CHWP incorporates additional services, which were not part of the original CHWP packages, this include high-impact curative services, such as integrated community case management, community-based newborn care, and treatment of common childhood illnesses.	Six innovations were rolled out in 2008 out of 13 pilot innovations to become part of the CHWs scope of services.
CHWs: Community Health Workers; CHWP: Community Health Worker Program; PHC: Primary Health Care			

Table 4: Example of evidence from Ethiopia and Pakistan's Community Health Worker Programs.

Strong Evidence

Strong evidence was available for most of the Indicator-Activities (22/29) across both CHWPs. There are 13 Indicator-Activities for the principle of 'Universal Health Coverage' (UHC) and its sub-attributes; strong evidence was available for 12 of those 13 activities (Table 3). As an example, the Indicator-Activity of service provision and defined catchment area encompasses whether a program clearly defines a sub-set of population to which a CHW is tasked with to provide a set of locally relevant services. Both CHWPs stated distinct number of individuals to whom each CHW is responsible for providing a definitive set of health services such as maternal health, basic treatment, contraceptives and referrals (Table 4) [32,36,42].

There are two Indicator-Activities related to the principle of 'Intersectoral Coordination'. Strong evidence was available for both of them. For example, evidence was available for 'representation of non-health organizations on planning and governance structures' in HEP where documents reported multi-sectoral, inter-ministerial partnership involving the ministries of health, finance, education and labour [34]. This program also showed evidence of collaborations with other subnational health authorities and finance bureaus for provision of training and salaries of CHWs via a payroll system. On the other hand, for NPFPPHC there was partial evidence identified for this Indicator-Activity under the principle of 'Intersectoral Coordination' (Table 4) [42]. Overall level of evidence was therefore classified as 'strong evidence' for this Indicator-Activity. Similarly, for the Indicator-Activity 'public-private partnership' the evidence was reported in two types of documents from HEP but was noted in only one of the planning documents of NPFPPHC (Table 3) [43,44].

Strong evidence was noted for the Indicator-Activity of 'joint ownership and design of the CHWP' under the principle of 'Community Participation' (Table 3). For example, community organization for health promotion activities and selection of CHW from within the area reflects this principle in NPFPPHC [38,39]. The HEP documents revealed a well-defined stepwise strategy for inclusion of community in all stages of program planning and implementation; from decision-making to evaluating the CHWP in Ethiopia (Table 4) [32,34].

Strong evidence was found for majority (9/12) of the Indicator-Activities related to the principle of 'Appropriateness' and its sub-attributes (effectiveness, cultural acceptability, affordability and manageability). For example, the evidence related to the Indicator-Activity 'monitoring health outcomes' reflecting effectiveness under the principle of 'Appropriateness was identified across all types of documents of both CHWPs. Both programs have designed and implemented health information systems to improve continuous monitoring and evaluation of the CHWP (Table 4). On the other hand, the evidence for the Indicator-Activity 'context specific program design and implementation' was noted in only an evaluation report of NPFPPHC. The partial evidence for this Indicator activity points out that NPFPPHC focusses on the needs of marginalized population in general, but may not be specifically targeting subpopulation groups with specific concerns such as remoteness, nutritional deficiencies or relatively higher health education need [42]. Whereas, the evidence was found in two types of documents in HEP (strong evidence) [32,43]. Overall level of evidence was therefore classified as 'strong evidence' for this Indicator-Activity.

Partial Evidence

Partial evidence was noted for four Indicator-Activities (Table 3). The evidence was partial in both CHWPs for the Indicator-Activities 'proportionate service provision' and 'CHWs role adjustment as the program evolves with respect to communities' needs' under the principle of appropriateness. Whereas, no information was found related to the Indicator-Activities 'cost effective interventions' and 'addressing financial barriers to health care' in NPFPPHC under the principle of appropriateness while there was partial evidence available for these activities in HEP. Overall level of evidence was therefore classified as 'partial' for these Indicator-Activities.

As an example, the evidence for 'proportionate service provision' was noted in only an implementation document of the HEP and only in an evaluation report of NPFPPHC [36,42]. The evidence for 'CHWs role adjustment' was noted only in an evaluation report of HEP indicating that the program incorporates additional services, which were not part of the original HEP packages and include high-impact curative services such as integrated community case management, community-based newborn care, and treatment of common childhood illnesses (Table 4). Similarly, the evidence for this activity was noted only in an evaluation report of NPFPPHC (Table 3).

No evidence

There was no evidence available in any type of documents for two Indicator-Activities 'ensure privacy and confidentiality' and 'health literacy' (Table 3).

The descriptors for the Indicator-Activities developed through Delphi research was refined by merging and appropriate placement of the Indicator-activities under a specific PHC principle or a sub-attribute of the principle based on the evidence found in this document analysis. The resultant list of Indicator-Activities with their description is provided in Table 5.

PHC Principle	Indicator-Activity	Example Description
Universal Health Coverage	Service Provision	Provision of (i) maternal, newborn and child health services (ii) physical and mental health care services (iii) outreach services to remote areas and (iv) horizontal integration at the service delivery level
	Defined catchment area	Define the catchment area with reference to the population that is to be served by the CHW program. This would facilitate needs assessment, service provision and connection to the formal health system in an organised manner.
	Selection and placement of CHWs	Select CHWs based on a broad criterion not limited by a literacy threshold; universal placement of CHWs in all areas of the country, even the remotest hamlets; appropriate distribution of CHWs across a population to make it feasible for the CHW workload and individual care seeking
	Community Sensitization	Inform the community about the core activities of the coverage and ensure that the community is aware of their right to have access to the needed care
Equity	Needs assessment	Identify varying needs of sub-population groups to provide equity-based care; assess the staff and material needs of sub-population to distribute them accordingly; assess what could work or not in each community in a manner (sensitive to social, economic and cultural aspects) and with a social determinants of health lens – Comprehensiveness
	Equity-based planning and implementation	Plan and provide services that address the local inequities in service coverage and health outcomes across different types of demographics with an understanding about dynamics of discrimination within the local context and according to the needs of disadvantaged groups
	Address financial and geographic barriers to health care	Provide PHC services close to the community through outreach and no user fee especially in rural health centres;
Access	Identification of the causes of low demand and utilization	Identify physical barriers and other supply-based barriers like access to quality care and human resources for health, supplies and commodities
	Promote community access to the program	Ensure that all community members can access the program irrespective of distance, ethnic or religious group, gender, age, social status, physical and mental state, and ability to pay
	Ensure privacy and confidentiality	Train CHWs to provide services considering privacy and confidentiality of the community members
Comprehensiveness	Provision of health services along the spectrum of preventive, curative, and rehabilitative services	Presence of a functional health unit within the catchment area with primary health care activities
	Linkages with secondary and tertiary level services	Establish linkages with other service providers and referral pathways to ensure comprehensiveness of a service package, especially if very few or no curative services are being provided directly by the CHWs and collaborate in governance structures from local to national level

PHC Principle	Indicator-Activity	Example Description
Community Participation	Joint ownership and design of CHWPs	• Engage community representatives to make sure that they are aware and involved in the design, implementation and evaluation of the program • Involve community at all levels of decision making from planning, training, selecting and oversight of CHWs • Ensure feedback from the community • Ensure that the community is informed, provide feedback and participate in decision-making • Establish a practical monitoring system incorporating data from communities and the health system
Intersectoral Coordination	Representation of non-health organisations on planning and governance structures of CHWPs	Negotiate to promote health and addressing needs of water, sanitation, food, housing and transport
	Public private partnership	CHWP works with government officials and with [other actors] in the community development sector; Provide benefit packages to particular populations (e.g. cash transfers for pregnant and lactating woman or households below the poverty line)
Appropriateness	Context specific program design and implementation	Plan and implement interventions which adhere to community culture and demand
	Evidence-based interventions	Prioritize technically sound and operationally manageable service packages with maximum health impact
Effectiveness	Monitoring health outcomes	Assess health outcomes with reference to the stated goals and from an equity lens; Ensure that quality of care is an integral part of the monitoring systems
	Monitoring performance	Assess the competence of CHWs regularly on to make sure that they are skilled to address poor health and confident to be pro-active in using these skills.
	Well-resourced CHWs	Provide regular training, supplies and supervision to CHWs in order to ensure intended health outcomes
Cultural acceptability	Community involvement in the selection of the CHWs	Consider factors influencing care-seeking by underserved groups e.g. language and other cultural norms.
	Health Literacy	Monitor that messages shared by CHWP [are such] to which people [relate to] and understand
Affordability	Cost effective interventions	Assess the chosen and alternate interventions financially and in a context-specific manner; assess if the full spectrum of treatment needed is affordable by the CHWP
	Identify and address financial barriers to health care	Assess if transport cost is a barrier and provide subsidy/transport if necessary
Manageability	Adequate human resources	Supervisors, program managers and frontline health staff must have the capacity, clear role, time and resources to provide adequate supportive supervision and performance review
	Proportionate service provision	Consider the range and complexity of services along with the size of the population to be served
	Continuous adjustment of the role of CHWs as the program evolves with respect to communities' needs	Full-time, salaried CHW versus part-time, voluntary CHW; Make sure that the time commitment and renumeration of the CHWs are according to service package and catchment area

PHC Principle	Indicator-Activity	Example Description
CHWs: Community Health Workers; CHWP: Community Health Worker Program; PHC: Primary Health Care		

Table 5: Indicator-Activities reflecting the application of primary health care principles in a community health worker program.

Discussion

To the best of our knowledge, this is the first study that assessed the utility of a set of Indicator-Activities for the application of PHC principles by CHWPs in LMICs. Findings of this document analysis confirm that the PHC Indicator-Activities are applicable to the CHWPs as most (22/29) of these Indicator-Activities are evident in the two national level CHWPs. The results have also highlighted areas that CHWPs need to focus on to improve community engagement to increase program acceptance, access and utility.

CHWPs' success is founded on PHC approach, and the Indicator-Activities can be used as descriptors to optimize the application of PHC principles by these programs. Evaluating CHWPs often proves to be difficult due to variability in their defining characteristics and because of their emphasis on certain particular roles and responsibilities of CHWs [45]. These roles and responsibilities of CHWs may also vary due to the national context (morbidity, national priorities, fiscal situation etc.); however, despite varying roles and responsibilities CHWPs should still focus on PHC principles.

As CHWPs are complex entities their assessment needs to be based on the data derived from a mix of reliable sources and obtained through the use of mix methods. There are numerous existing tools to measure performance of individual CHWs, programmatic determinants of CHW performance, community level outcomes and contextual factors that influence a CHWP [16]. However, these tools tend to focus more on governance, managerial, administration and fiscal aspects of the CHWPs. The set of Indicator-Activities identified through a Delphi process and assessed for its utility through this document analysis, is added to this toolbox and fills the gap in the method to assess application of PHC principles by CHWPs. Used in combination with the existing tools, Indicator-Activities can provide a complete picture of CHWP performance from PHC perspective. Therefore, these Indicator-Activities could be used to plan and monitor national level CHWPs in LMICs, track outcomes and assess whether these programs are meeting their intended objectives related to PHC principles.

The evidence for the Indicator-Activities 'ensuring privacy and confidentiality of the clients' for the principle of UHC and 'health literacy' for the principle of appropriateness could not be found in the documents reviewed in this study. However, we have not removed these Indicator-Activities out of the final list because of their relevance to improving access and cultural acceptability. Health literacy is the ability to engage with health information and services.46 It helps individuals to make effective use of available health services [47]. Low health literacy is a significant problem in many LMICs because of the low levels of general literacy and poorly resourced and functioning health systems with less than adequate investment in health education programs [48]. There is evidence on effective health literacy interventions improving health outcomes in LMICs [47,48]. With reference to 'ensuring privacy and confidentiality', CHWs have shown to be keen to observe ethical principles while carrying out their roles [49]. However, there is need to equip them with training and provision of relevant guidelines [49].

One of the limitations of this study is that the assessment of the utility of Indicator-Activities relied on program documents only. Assessment could be more rigorous if documents analysis is combined with discussions and interviews with CHWP staff and observation of the CHWP activities in the field. COVID-19 pandemic did not allow visits to program sites. Hence, a future study could be planned allowing that additional methodological rigor.

Secondly, this study has reported lack of evidence for the Indicator-Activities 'ensuring privacy and confidentiality of the clients' and 'health literacy'. There is a possibility that these activities are part of CHWPs but were not described in the documents that were available for the review. This may be one of the limitations of this study as the evidence may be there in other documents we could not get hold.

Thirdly, the evidence is assessed by one reviewer and the individual subjective view may have affected the decision of whether a document has evidence related to a specific Indicator-Activity. This needs to be verified further by having two independent reviewers in future assessments of the Indicator-Activities. Moreover, we have not placed any weighting on the quality of evidence that was found for the Indicator-Activities assesses in this study. The Indicator-Activities need further validation through their application on a broader range of CHWPs in different countries and also through a more in-depth assessment of the quality of evidence.

Conclusion

The findings of this document analysis indicate that PHC Indicator-Activities are useful to the CHWPs across LMICs. These Indicator-Activities can be used to assess the application of PHC principles, which can inform planning, implementation, and evaluation of CHWPs. Future research may focus on assessing the Indicator-Activities in the field and applying them on a broad range of CHWPs.

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Title of the document:				
Type of the document:				
Year published / prepared				
Author/s				
PHC Principle	**Indicator-Activity**	**Related Activity Present in the CHWP**		**Description of the evidence from the CHWP Documents**
		Yes	**No**	
Universal Health Coverage	Service Provision			
	Selection and placement of CHWs			
	Defined catchment area			
	Community Sensitization			
	Needs assessment			
Equity	Planning			
	Implementation			
	Address financial and geographic barriers to health care			
Access	Identification of the causes of low demand and utilization			
	Promote community access to the program			
	Ensure privacy and confidentiality			
Comprehensiveness	Provision of health services along the spectrum of preventive, curative, and rehabilitative services			
	Linkages with secondary and tertiary level services			
Community Participation	Joint ownership and design of CHWPs			
	Availability of health data to the community			
Intersectoral Coordination	Representation of non-health organisations on planning and governance structures of CHWPs			
	Public private partnership			

Appropriateness	Context specific program design and implementation			
	Evidence-based interventions			
Effectiveness	Monitoring health outcomes			
	Monitoring performance			
	Well-resourced CHWs			
Cultural acceptability	Community involvement in the selection of the CHWs			
	Health Literacy			
Affordability	Cost effective interventions			
	Identify and address financial barriers to health care			
Manageability	Adequate human resources			
	Proportionate service provision			
	Continuous adjustment of the role of CHWs as the program evolves with respect to communities' needs			
CHWs: Community Health Workers, CHWP: Community Health Worker Program, PHC: Primary Health Care				

Appendix 1: Data Extraction Form.

Title of the document	Type	Year	Author
Health Extension Program of Ethiopia			
Planning documents			
Realizing Universal Health Coverage through Primary Health Care - A roadmap for optimizing the Ethiopian Health Extension Program 2020-2035	Planning document	2020	Ministry of Health, Ethiopia
Implementation documents			
Health for the People: National Community Health Worker Programs from Afghanistan to Zimbabwe	Case studies	2020	Henry B. Perry, Editor
Ethiopia and the Health Extension Program: Learning for Action Across Health Systems	Case Study	2017	Oxford Policy Management
Ethiopia Health Extension Program : an institutionalized community approach for universal health coverage	Case Study	2016	World Bank Group
Health Extension Workers in Ethiopia: Delivering community-based antenatal and postnatal care	Project working paper	2014	Harvard School of Public Health
The Health Extension Program in Ethiopia	Case Study	2013	The UNICO Studies Series – The World Bank
Health Extension Program: An Innovative Solution to Public Health Challenges of Ethiopia A Case Study	Case Study	2012	USAID
Global experience of CHWs for delivery of health related MDGs: a systematic review, country case studies and recommendations for integration into national health systems	Country Case Study	2010	Global Health Workforce Alliance (GHWA) – World Health Organization (WHO)
Ethiopia's Human Resources for Health Programme	Country Case Study	2008	WHO-GHWA Task Force on Scaling Up Education and Training for Health Workers
Evaluation documents			
National Assessment - 2019	Evaluation Report	2020	MERQ Consultancy
National Program for Family Planning and Primary Health Care of Pakistan			
Planning documents			
Integrated Reproductive, Maternal, Newborn, Child & Adolescent Health, and Nutrition (IRMNCAH&N) Strategy	Planning document	2016	Provincial Ministry of Health
PC-1 from Jan 2010 to June 2015	Planning Commission Form	2010	Ministry of Health, Government of Pakistan
Implementation documents			
Health for the People: National Community Health Worker Programs from Afghanistan to Zimbabwe	Case studies	2020	Henry B. Perry, Editor
Lady health workers in Pakistan-improving access to health care for rural women and families	Project working paper	2014	Harvard School of Public Health
The contribution of lady health workers towards family planning in Pakistan	Policy brief	2012	USAID

Title of the document	Type	Year	Author
Global experience of CHWs for delivery of health related MDGs: a systematic review, country case studies and recommendations for integration into national health systems	Country Case Study	2010	WHO-Global Health Workforce Alliance
Pakistan's Lady Health Worker Program	Country Case Study	2008	WHO-Global Health Workforce Alliance
Pakistan's experience in lady health worker program	Meeting report	2004	Ministry of Health, Government of Pakistan
Evaluation documents			
Lady Health Worker Program, Pakistan; Performance Evaluation	Evaluation Report	2019	Oxford Policy Management
External Evaluation of the National Program for Family Planning and Primary Health Care	Evaluation Report	2009	Oxford Policy Management
Note: All the above-mentioned documents are available on internet/with the corresponding author and can be provided if needed.			

Appendix 2: List of documents included in this analysis.