Optimising Community Health Worker Programmes

A Search Strategy for 15 Systematic Reviews

Developed for the WHO
Prepared by:
Aron Shlonsky; Patrick Condron; Bianca Albers; Loyal Pattuwage;

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Centre for Evidence and Implementation
Level 6, 250 Victoria Parade, East Melbourne VIC 3002
Web: cei.org.au
Twitter: @CEI_org
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1. Overarching Research Aims

In the last few years, there has been growing interest and attention in the potential of various types of community health workers (CHWs) in reducing inequities in access to essential health services, particularly in under-served or excluded, vulnerable populations. The emerging “WHO Global Strategy on Human Resources for Health (HRH): Workforce 2030” encourages countries to adopt a diverse, sustainable skills mix, harnessing the potential of community-based and mid-level health workers in inter-professional primary care teams.¹

The contribution of CHWs in successful delivery of population-based health interventions has been highlighted in several areas such as neonatal and child health, infectious diseases, non-communicable diseases tropical diseases.⁴⁷ There is also evidence that provision of; education and training, some form of remuneration, supervision, ongoing training and establishment of their role in the health care system may improve their integration into the system.⁷⁻⁹

The support for community health workers and their integration into the health system, however, remain uneven across and within countries. This is hindering the full realization of their potential contribution to the implementation of health policies based on primary health care. Although they should be considered as an integral part of the health system, CHW programmes are often fraught with challenges, including: poor planning; unclear roles and education pathways; multiple competing actors with little coordination; fragmented, disease-specific training; donor-driven management and funding; tenuous linkage with the health system; poor coordination, supervision, quality control and support; and under-recognition of CHWs’ contribution.¹⁰

Optimizing the design and performance of CHW programs requires streamlined nomenclature, clarity on competencies and roles of community health workers, and agreed criteria for sustainable support by and integration in local and national health systems and plans.¹¹,¹²

The WHO aims to address these issues through the development of new guidelines on health policy and system support. The purpose of these guidelines is to improve CHW programmes by identifying optimal training and working conditions for the CHWs and enhance their functions. The guidelines will assist national governments as well as national and international partners in improving the design, implementation, performance and evaluation of CHW programmes, by providing recommendations in the areas of CHW selection, education, continuing training, linkage with other health workers, management, supervision, performance enhancement, incentives, remuneration, governance, health system integration.

To inform the guideline development, WHO has commissioned 15 systematic reviews examining the current best evidence on optimal training and working conditions for CHWs.

This document details the search strategy for the conduct of these reviews. It has been informed by key guidance on the conduct of narrative synthesis developed for research teams that conduct systematic reviews for policy and practice²⁰. This guidance will also inform later steps in the review process.
2. Defining Community Health Workers

The term “community health workers” is often used in a non-specific way, referring to a diverse typology of lay and formally educated, formally and informally assigned, paid and unpaid health workers. A repository of terms such as “lay health workers”, “frontline health workers”, “close-to-community providers” that are somewhat synonymous to CHWs can currently be found in the literature but, these terms can also denote some variance in their scope of practice, training, and their relation to the health system.

Olaniran et al. (2017) identified 119 publications that describe and define roles of CHWs. These differ widely, based on e.g. how CHWs were selected, their roles and tasks, training received and wages (if any). 90 of the publications described the role of CHWs in relation to the roles and tasks performed in the community or health care facility. Twenty-one publications also included educational qualifications or pre-service training in CHW descriptions and definitions. In some of these studies, CHWs were defined as unpaid volunteers and in others as a cadre service providers that received a salary, an allowance, or performance-based incentives. Differences like these make it difficult to find a universally accepted single definition of CHWs.

The international standard classification of occupations by the International Labour Office states:

“Community health workers provide health education, referral and follow-up, case management, basic preventive health care and home visiting services to specific communities. They provide support and assistance to individuals and families in navigating the health and social services system” (p. 192).

WHO has used the following definition:

“Community health workers should be members of the communities where they work, should be selected by the communities, should be answerable to the communities for their activities, should be supported by the health system but not necessarily a part of its organization, and have shorter training than professional workers” (p. 5).

A similar approach is reflected in a recent systematic review of reviews by Scott et al., who also include a generally lower level of education as a key characteristic of CHWs, who are described as “… frontline health care providers who live in the community they serve and receive lower levels of formal education and training than professional health care workers such as nurses and doctors” (p 5).

The commonalities aligning these definitions are that CHWs have a supportive function in health service delivery, including the provision of direct health services, health advocacy, and community agency. Furthermore, community health workers are directly connected to the communities they serve - they live in them and are accountable to them - and have lower levels of education when compared to trained health workers such as doctors and nurses. These characteristics will be operationalised in the search strategy presented below.
3. Search Strategy and Brief Description of Synthesis Methods

The search strategy is summarised in table 1 below. Subsequently, we present each of the steps in greater detail, including a brief description of methods for data extraction and synthesis. A complete protocol will be developed and submitted after search methods are finalised.

Table 1: The search strategy

<table>
<thead>
<tr>
<th>PICOS Category</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Included in this project will be studies that focus on CHWs as defined through specific inclusion criteria (see section 3.3). This overarching search will be applied to all PICOS that are part of this project and is detailed below in section 3.1</td>
</tr>
<tr>
<td>Intervention</td>
<td>PICOS specific search strings will be developed to capture the different interventions included in each of the 15 systematic reviews. Each of these specific search strategies will be combined with the overarching search to form the final search strategy for each systematic review topic.</td>
</tr>
<tr>
<td>Comparison</td>
<td>No further search terms will be utilised to limit the output to specific comparison conditions. All studies will be included, irrespective of the comparisons reported.</td>
</tr>
<tr>
<td>Outcomes</td>
<td>No further search terms will be utilised to limit the output to specific outcomes. Instead, we will retrieve all publications, irrespective of the outcomes reported.</td>
</tr>
<tr>
<td>Study Design</td>
<td>Any study design will be included in the 15 systematic reviews</td>
</tr>
</tbody>
</table>

3.1. The search

As indicated in the original proposal, all 15 systematic reviews will be underpinned by a primary search to broadly identify all possible studies involving CHWs across all countries.

The example in table 2 is developed for Ovid Medline and will be tailored to suit other databases. This primary search will remain the same for all 15 PICOS driving each of the reviews. Methodological filters will not be applied.

Table 2: CHW Search Terms

<table>
<thead>
<tr>
<th>No.</th>
<th>Search Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>community health workers/exp</td>
</tr>
<tr>
<td>2</td>
<td>&quot;frontline health worker**&quot;.mp</td>
</tr>
<tr>
<td>3</td>
<td>((community or lay or volunteer or voluntary or family or rural or village or lady or basic or frontline) adj (health or healthcare or health care or medical or care or drug or nutrition) adj (worker* or aide* or distributor* or surveyor* or assistant* or promoter* or agent* or auxiliar* or motivator* or helper* or representative* or volunteer* or provider* or officer*).mp</td>
</tr>
<tr>
<td>4</td>
<td>((chw or chws or lhw or lnws or vhw or vhws) not &quot;liquid hot water&quot;).mp</td>
</tr>
<tr>
<td>5</td>
<td>&quot;health promoter**&quot;.mp</td>
</tr>
<tr>
<td>6</td>
<td>(&quot;community health&quot; adj1 worker*).mp</td>
</tr>
</tbody>
</table>
### Search Terms

<table>
<thead>
<tr>
<th>No.</th>
<th>Search Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>&quot;community volunteer&quot;.mp</td>
</tr>
<tr>
<td>8</td>
<td>&quot;peer educator&quot;.mp</td>
</tr>
<tr>
<td>9</td>
<td>&quot;outreach worker&quot;.mp</td>
</tr>
<tr>
<td>10</td>
<td>&quot;health agent&quot;.mp</td>
</tr>
<tr>
<td>11</td>
<td>(Promotora or promotoras).mp</td>
</tr>
<tr>
<td>12</td>
<td>&quot;community practitioner&quot;.mp</td>
</tr>
<tr>
<td>13</td>
<td>&quot;health assistant&quot;.mp</td>
</tr>
<tr>
<td>14</td>
<td>Anganwadi.mp</td>
</tr>
<tr>
<td>15</td>
<td>&quot;health extension worker&quot;.mp</td>
</tr>
<tr>
<td>16</td>
<td>&quot;barefoot doctor&quot;.mp</td>
</tr>
<tr>
<td>17</td>
<td>&quot;accredited social health activist&quot;.mp</td>
</tr>
<tr>
<td>18</td>
<td>kader.mp</td>
</tr>
<tr>
<td>19</td>
<td>&quot;malaria agent&quot;.mp</td>
</tr>
<tr>
<td>20</td>
<td>&quot;community based practitioner&quot;.mp</td>
</tr>
<tr>
<td>21</td>
<td>&quot;health auxiliary&quot;.mp</td>
</tr>
<tr>
<td>22</td>
<td>&quot;health surveillance assistant&quot;.mp</td>
</tr>
<tr>
<td>23</td>
<td>(&quot;community healthcare&quot; or &quot;community health care&quot;) adj worker*.mp</td>
</tr>
<tr>
<td>24</td>
<td>animator.mp</td>
</tr>
<tr>
<td>25</td>
<td>&quot;nutrition counselor&quot;.mp</td>
</tr>
<tr>
<td>26</td>
<td>&quot;family welfare assistant&quot;.mp</td>
</tr>
<tr>
<td>27</td>
<td>(child adj (health or healthcare or &quot;health care&quot;) adj worker*).mp</td>
</tr>
<tr>
<td>28</td>
<td>(Behvarz or Monitora or &quot;barangay health worker&quot; or Accompagnateur or Activista or Sevika or Brigadista or Animatrice or Socorrista or &quot;Agente comunitario de salud&quot; or &quot;Agente comunitario de saude&quot; or &quot;agentes de saude&quot; or &quot;Colaborador voluntario&quot; or &quot;Shastho karmis&quot; or &quot;Shastho shebika&quot; or &quot;Shasthya Shebika&quot;).mp</td>
</tr>
<tr>
<td>29</td>
<td>(&quot;close to community provider&quot; or &quot;Lead Mother&quot; or &quot;community imci&quot; or &quot;outreach educator&quot; or &quot;community resource person&quot; or &quot;nutrition agent&quot; or &quot;Mobile Clinic Team&quot; or &quot;Mother coordinator&quot; or &quot;Village drug-kit manager&quot; or &quot;Bridge-to-Health Team&quot; or &quot;female multipurpose health worker&quot; or &quot;community case management worker&quot; or &quot;community surveillance volunteer&quot;).mp</td>
</tr>
<tr>
<td>30</td>
<td>((&quot;family planning&quot; or &quot;health promotion&quot;) adj (worker* or aide* or distributor* or surveyor* or assistant* or promoter* or agent* or auxiliary* or motivator* or helper* or representative* or volunteer* or provider* or officer*)).mp</td>
</tr>
<tr>
<td>31</td>
<td>Or/1-30</td>
</tr>
</tbody>
</table>

### Databases

The following databases will be searched as part of this project:

- Ovid Medline: Epub Ahead of Print, In-Process & Other Non-Indexed Citations and 1946 to Present
- EMBASE
- Cochrane
- CINAHL
- PsycINFO
- LILACS
- Global Index Medicus
- POPLINE
Furthermore, the grey literature will be searched for further relevant publications. These searches will be based on the following databases:

- OpenGrey
- TROVE
- Google Scholar

In addition, the research team will reach out to relevant organisations and agencies to solicit grey literature that may not be available online. The selection of these organisations and agencies will be confirmed with WHO.

Finally, the references of included articles will be examined for relevant citations.

### 3.3. PICOS specific searches

To identify relevant literature for each PICOS, the primary CHW focused search string will be combined with each of the search strings presented in table 3 below. These search strings were developed with a focus on the particular intervention included in each PICOS.

<table>
<thead>
<tr>
<th>Question</th>
<th>Search Terms</th>
</tr>
</thead>
</table>
| **Q1: In CHWs being selected for pre-service training, what strategies for selection of applications for CHWs should be adopted over what other strategies?** | 1. Primary CHW search  
2. ((workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or (voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services or program or practice))).mp.  
3. 1 OR 2  
4. ((selection or employment or recruitment) adj2 (criteria or process or reasons or characteristics)).mp.  
5. ("personnel selection" or "entry requirement*" or "job requirement*").mp.  
6. (attribute* or applicant*).mp.  
7. OR/4-6  
8. 3 AND 7                                                                                           |
| **Q2: For CHWs receiving pre-service training, should the duration of training be shorter versus longer?** | 1. Primary CHW search  
2. ((workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or (voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services or program or practice))).mp.  
3. 1 OR 2  
4. (training or course or class or classes or education or learning).mp.  
5. education.fs.  
6. 4 OR 5  
7. 3 AND 6  
8. (duration or length or "period of time").mp.  
9. ((hour or hours or day or days or week or weeks) adj3 (training or course or courses or education))).mp.  
10. 8 OR 9  
11. 7 AND 10                                                                                           |
| **Q3: For CHWs receiving pre-service training, should the curriculum address specific versus nonspecific competencies?** | 1. Primary CHW search  
2. ((workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or (voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services or program or practice))).mp.  
3. 1 OR 2  
4. (training or course or class or classes or education or learning).mp.  
5. education.fs.  
6. 4 OR 5                                                                                           |
<table>
<thead>
<tr>
<th>Question</th>
<th>Search Terms</th>
</tr>
</thead>
</table>
| Q4: For CHWs receiving pre-service training, should the curriculum use specific delivery modalities versus not? | 1. Primary CHW search  
2. `(workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or ((voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services))))).mp.  
3. 1 OR 2  
4. (training or course or class or classes or education or learning).mp.  
5. education.fs.  
6. 4 OR 5  
7. 3 AND 6  
8. ("community based" or "hospital based" or "health facility based").mp.  
9. ("flexible learning" or "field placement" or "service training" or "distance education" or "distance learning" or mooc or moocs).mp.  
10. ((training or course or class or classes or education or learning) adj3 (delivery or modality or modalities)).mp.  
11. ("face to face" or online or blended or mobile or "web based" or electronic) adj3 (training or course or class or classes or education or learning)).mp.  
12. OR/8-11  
13. 7 AND 12                                                                                                                                                                                                                                                                          |
| Q5: In CHWs who have received pre-service training, should competency-based formal certification be used versus not? | 1. Primary CHW search  
2. `(workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or ((voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services))))).mp.  
3. 1 OR 2  
4. certification or approval or accreditation or "competency based").mp.  
5. ("work performance" or "job performance").mp.  
6. community health workers/st  
7. health manpower/st  
8. ("skill level" or retraining or "performance evaluation" or "performance assessment").mp.  
9. ("refresher training" or "continuous education" or "education, continuing").mp.  
10. OR/4-9  
11. 3 AND 10                                                                                                                                                                                                                                                                         |
| Q6: In the context of CHWs programmes, what strategies of supportive supervision should be adopted over what other strategies? | 1. Primary CHW search  
2. `(workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or ((voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services))))).mp.  
3. 1 OR 2  
4. (supervision or supervisor or supervisors or supervisory).mp.  
5. (coach or coaching or coaches).mp.  
6. ("personnel system" or "personnel structure" or manager or managers or mentor or mentors).mp.  
7. (autonomy or accountability).mp.  
8. OR/4-7  
9. 3 AND 8                                                                                                                                                                                                                                                                         |
| Q7: In the context of CHWs programmes, should practicing CHWs be paid for their work versus not? | 1. Primary CHW search  
2. `(workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or ((voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services))))).mp.  
3. 1 OR 2  
4. (payment or salary or salaries or "salaries and fringe benefits" or pay or paid).mp.  
5. remuneration or incentive or incentives or financial or finance or income or compensation or wage or wages).mp.  
6. ("employee retention" or "personnel retention" or "community health worker retention" or...
<table>
<thead>
<tr>
<th>Question</th>
<th>Search Terms</th>
</tr>
</thead>
</table>
| **Q8:** In the context of CHWs programmes, should practicing CHWs have a career ladder opportunity/ framework versus not? | 1. Primary CHW search  
2. ((workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or ((voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services))).mp.  
3. 1 OR 2  
4. "career ladder".mp.  
5. ((career or job or staff) adj1 (advancement or opportunit* or framework or development)).mp.  
6. "career path" or "career pathway".mp.  
7. ("career plan*" or "career structure*").mp.  
8. "professional development".mp.  
9. ("personnel turnover" or "retaining staff" or "retaining personnel" or retention).mp.  
10. OR/4-9  
11. 3 AND 10 |
| **Q9:** In the context of CHWs programmes, should practicing CHWs have a formal contract versus not? | 1. Primary CHW search  
2. ((workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or ((voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services))).mp.  
3. 1 OR 2  
4. "employment contract".mp.  
5. "work contract".mp.  
6. "terms of understanding".mp.  
7. "conditions of work".mp.  
8. "work conditions".mp.  
9. "written agreement".mp.  
10. (agreement adj5 (work or employment or labour or labor or working or employed or employee*)).mp.  
11. "employment conditions".mp.  
12. "conditions of service".mp.  
13. ("job expectation*" or "work expectation*" or "employment expectation*").mp.  
15. "contract of employment".mp.  
17. or/4-16  
18. (contract or contracted or contracts).mp.  
19. 3 and 17  
20. 3 and 18  
21. 19 or 20 |
| **Q10:** In the context of CHW programmes, should there be a target population size versus not? | 1. Primary CHW search  
2. ((workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or ((voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services))).mp.  
3. 1 OR 2  
4. (coverage or "target population" or catchment).mp.  
5. ("client number" or "client numbers" or "number of clients").mp.  
6. workload.mp.  
7. ((worker* or employee* or volunteer*) adj2 distribution).mp.  
8. ("time management" or "personnel staffing and scheduling").mp.  
9. (proximity adj2 (service or services)).mp.  
10. (travel or "spatial access").mp.  
11. (deploy or deployed or deployment).mp.  
12. (per adj1 (population or inhabitants or persons)).mp.  
13. or/4-12  
14. 3 and 413 |
<table>
<thead>
<tr>
<th>Question</th>
<th>Search Terms</th>
</tr>
</thead>
</table>
| Q11: In the context of CHWs programmes, should practicing CHWs collect, collate, and use health data versus not? | 1. Primary CHW search  
2. ((workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or ((voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services))).mp.  
3. 1 OR 2  
4. ((data or record or records or information) adj2 (collection or collector or collectors or collate or collation or collating or "use" or quality or capture)).mp.  
5. ((cell or mobile or smart or cellular) adj1 (phone* or telephone* or device* or tablet*)).mp.  
6. smartphone*.mp.  
7. ("mobile health" or mhealth).mp.  
8. ("record keeping" or "report writing" or reporting or documentation or "health record*" or "medical record*").mp.  
9. feedback.mp.  
11. or/4-10  
12. 3 and 11                                                                                                                                                                                                 |
| Q12: In the context of CHWs programmes, should practicing CHW work in a multi-cadre team versus in a single cadre CHW system? | 1. Primary CHW search  
2. ((workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or ((voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services))).mp.  
3. 1 OR 2  
4. (specialist* or specialisation or specialization or specialised or specialized).mp.  
5. (cadre or cadres or multicadre*).mp.  
6. (polyvalent or multivalent or monovalent or "poly valent" or "multi valent" or "mono valent").mp.  
7. (team or teams or teamwork).mp.  
8. (generalist or general).mp.  
9. advanced.mp.  
10. multimodal.mp.  
11. ((work or workforce or employee* or worker*) adj2 (role or roles)).mp.  
12. or/4-11  
13. 3 and 12                                                                                                                                                                                                 |
| Q13: In the context of practicing CHW programmes, are community engagement strategies effective in improving CHW program performance and utilisation? | 1. Primary CHW search  
2. ((workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or ((voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services))).mp.  
3. 1 OR 2  
4. ((community or village) adj2 (engagement or engaged or committee* or participation or participatory or involved or involvement or liaison or group or groups or network* or ownership or learning or collaboration or relations)).mp.  
5. committee*.mp.  
6. (((mother or mothers or father or fathers or parent or parents or youth or religious or support or development or savings or credit or farmers or rural or health or project) adj1 (group or groups))).mp.  
7. "local participation".mp.  
8. (build* adj1 relationship*).mp.  
9. social network*.mp.  
10. ((peer adj1 leader*) or "change agent*").mp.  
11. or/4-10  
12. 3 and 11                                                                                                                                                                                                 |
| Q14: In the context of CHWs programmes, should practicing CHW mobilize wider community resources for health vs. not? | 1. Primary CHW search  
2. ((workforce or manpower or employment or (occupation or occupations) or (employee or employees) or "labor force") adj10 ("community health" or ((voluntary or volunteer* or rural or remote or village or villages or local) adj4 (health or service or services))).mp.  
3. 1 OR 2  
4. (mobilisation or mobilization).mp.  
5. (community adj2 (knowledge or empowerment or promotion or help or helping or support)).mp.  
6. (community adj2 (informant* or leader* or stakeholder*)).mp.  
7. (((priority or objective or objectives or goal or goals) adj1 (set or setting)) or prioritisation or prioritization).mp.  
8. feedback.mp.  
10. or/4-10  
11. 3 and 11                                                                                                                                                                                                 |
### 3.4. Inclusion and exclusion criteria

The yielded titles and abstracts of the database search will be screened using a combination of (a) general inclusion and exclusion criteria applicable to all PICOS and (b) PICOS specific inclusion and exclusion criteria. Table 4 below summarises the general criteria, whereas PICOS specific criteria are listed in table 5.

<table>
<thead>
<tr>
<th>Included</th>
<th>Excluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publications that report a study</td>
<td>Publications that do not report a study, e.g. opinion pieces, editorials, conference abstracts; single case studies; letters; advocacy materials</td>
</tr>
<tr>
<td>Studies focused on practicing Community Health Workers:</td>
<td></td>
</tr>
<tr>
<td>= health care workers who carry out population-based, health-related activities in their community</td>
<td></td>
</tr>
<tr>
<td>= these activities take place in a community they are directly connected to (they live in the community; are accountable to the community)</td>
<td></td>
</tr>
<tr>
<td>= workers, who have received no or only basic formal training; this training may be recognised by health services or a certification authority, but it is not a</td>
<td></td>
</tr>
<tr>
<td>Studies focused on non-Community Health Workers such as nurses, doctors, formally trained nurse-aids; Medical assistants, physician assistants; paramedical workers in emergency and fire services; others who are auxiliaries, e.g. mid-level workers and self-defined health professionals or health paraprofessionals; traditional, faith and complementary healers and traditional birth attendants</td>
<td>Studies focused on non-practicing (i.e. retired or unemployed) community health workers</td>
</tr>
</tbody>
</table>
Included
part of a formal tertiary education programme or qualification (e.g. degree, diploma, title, certificate course).

Studies conducted in high income countries, and in low and middle income countries

Studies conducted in underserved community settings

Studies conducted in general population settings

Excluded

Studies reporting on the role of training other than pre-service training (e.g., professional development, ongoing support, other forms of training)

Studies reporting on strategies for selecting job applicants only [no pre-service training involved]; for selecting trainees for ongoing training, on-the-job training or other types of training

Studies reporting on other factors related to the conduct of pre-service training (e.g., certification, aptitude))

Studies specifying the competencies of others than CHWs promoted through a pre-service curriculum.

Each PICOS focuses on a particular aspect of CHWs’ training and working conditions that will guide the definition of specific inclusion and exclusion criteria for each systematic review. These are summarised below.

Table 5: PICOS specific inclusion and exclusion criteria

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Included</th>
<th>Excluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q 1: In CHWs being selected for pre-service training, what strategies for selection of applications for CHWs should be adopted over what other strategies?</td>
<td>Studies reporting on the role of pre-service training</td>
<td>Studies reporting on the role of training other than pre-service training (e.g., professional development, ongoing support, other forms of training)</td>
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<tr>
<td></td>
<td>Studies reporting on strategies for selecting applicants for pre-service training</td>
<td>Studies reporting on strategies for selecting job applicants only [no pre-service training involved]; for selecting trainees for ongoing training, on-the-job training or other types of training</td>
</tr>
<tr>
<td>Q 2: For CHWs receiving pre-service training, should the duration of training be shorter versus longer?</td>
<td>Studies reporting on the role of pre-service training</td>
<td>Studies reporting on the role of training other than pre-service training (e.g., professional development, ongoing support, other forms of training)</td>
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<td>Studies reporting on the role of duration of the pre-service training, including e.g. length, structure (conduct in one vs. several sessions), dosage etc.</td>
<td>Studies reporting on other factors related to the conduct of pre-service training (e.g., certification, aptitude))</td>
</tr>
<tr>
<td>Q 3: For CHWs receiving pre-service training, should the curriculum address specific versus non-specific competencies?</td>
<td>Studies reporting on the role of pre-service training</td>
<td>Studies reporting on the role of training other than pre-service training (e.g., professional development, ongoing support, other forms of training)</td>
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<tr>
<td></td>
<td>Studies reporting the content of a curriculum describing the subjects and content that comprise the course of the pre-service training.</td>
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<tr>
<td></td>
<td>Studies specifying the competencies of CHWs promoted through a pre-service curriculum.</td>
<td>Studies specifying the competencies of others than CHWs promoted through a pre-service curriculum.</td>
</tr>
<tr>
<td>Research Question</td>
<td>Included</td>
<td>Excluded</td>
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<tr>
<td>Q 4: For CHWs receiving pre-service training, should the curriculum use specific delivery modalities versus not?</td>
<td>Studies reporting on the role of pre-service training</td>
<td>Studies reporting on the role of training other than pre-service training (e.g., professional development, ongoing support, other forms of training)</td>
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<tr>
<td></td>
<td>Studies reporting on the modalities of a curriculum delivery (e.g. face-to-face, electronic, in family settings etc.)</td>
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<tr>
<td>Q 5: In CHWs who have received pre-service training, should competency-based formal certification be used versus not used?</td>
<td>Studies reporting on the role of pre-service training</td>
<td>Studies reporting on the role of other than pre-service training (e.g., professional development, ongoing support, other forms of training)</td>
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<td></td>
<td>Studies reporting on approaches to formal certification including e.g., level of formality, accrediting body, core criteria for accreditation etc.</td>
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<tr>
<td>Q 6: In the context of CHWs programmes, what strategies of supportive supervision should be adopted over what other strategies?</td>
<td>Studies reporting on practices of supervision, including coaching and consultation, e.g., individual vs. group; peer vs. professional supervision; supervisor role; supervision frameworks; supervisor training etc.</td>
<td>Studies focused on other forms of professional support of CHWs (e.g. on-the-job training, study or reading groups, etc.)</td>
</tr>
<tr>
<td>Q 7: In the context of CHWs programmes, should practicing CHWs be paid for their work versus not?</td>
<td>Studies reporting on approaches to compensate CHWs for their work, including salaries, payment, remuneration, wage, reimbursement, non-financial compensation through e.g. advancement etc.</td>
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</tr>
<tr>
<td>Q 8: In the context of CHWs programmes, should practicing CHWs have a career ladder opportunity/ framework versus not?</td>
<td>Studies reporting on opportunities for advancement for CHWs and describe e.g. career pathways, structures for professional development etc.</td>
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<tr>
<td>Q 9: In the context of CHWs programmes, should practicing CHWs have a formal contract versus not?</td>
<td>Studies reporting on contracting conditions for CHWs including information about level of formality; form (written or not); contracting body (formal authority or other) etc.</td>
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<tr>
<td>Q 10: In the context of CHW programmes, should there be a target population size versus not?</td>
<td>Studies providing information about the optimal population size for individual or groups of CHWs, including community population sizes, case load, agency load etc.</td>
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</tr>
<tr>
<td>Q 11: In the context of CHWs programmes, should practicing CHWs collect, collate, and use health data versus not?</td>
<td>Studies reporting on the role of data collection as part of CHWs work routines, e.g. processes of regular data collection, regular data use etc. including those related to either written, oral or electronic data reporting to peers, supervisors or others</td>
<td></td>
</tr>
<tr>
<td>Q 12: In the context of CHWs programmes, should practicing CHWs work in a multi-cadre team</td>
<td>Studies reporting on CHW teaming structures and team composition including information on the</td>
<td></td>
</tr>
<tr>
<td>Research Question</td>
<td>Included</td>
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<tr>
<td>versus in a single-cadre CHW system?</td>
<td>degree of specialisation and the presence of competencies in team members and teams.</td>
<td>Studies reporting on the role of community engagement strategies in delivering community health programmes through community health workers, e.g. through village groups and committees; community networks; community wide action plans; community involvement in decision making etc.</td>
</tr>
<tr>
<td>Q 13: In the context of practicing CHW programmes, are community engagement strategies effective in improving CHW program performance and utilisation?</td>
<td>Studies reporting on the role of community engagement strategies in delivering community health programmes through community health workers, e.g. through village groups and committees; community networks; community wide action plans; community involvement in decision making etc.</td>
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</tr>
<tr>
<td>Q 14: In the context of CHWs programmes, should practicing CHW mobilize wider community resources for health vs. not?</td>
<td>Studies reporting on CHWs’ practices for resource mobilisation in their community, e.g. through resource identification and mapping; service coordination and streamlining; strengthening of referral pathways; utilisation of research resources etc.</td>
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<tr>
<td>Q 15: In the context of practicing CHWs programmes, what strategies should be used for ensuring adequate availability of commodities and consumable supplies over what other strategies?</td>
<td>Studies reporting on CHWs’ practices for ensuring the availability of commodities and consumable supplies, including e.g. through the utilisation of national supply planning, stock management tools, mobile phone applications and social media, coordination of re-supply procedures, etc.</td>
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</tbody>
</table>

3.5. Screening

Each review team involved in this project will be assigned 1-4 PICOS and will be responsible for the conduct of these reviews with oversight from the PI and advisory group. The distribution of reviews across teams is summarised in table 6 below.

<table>
<thead>
<tr>
<th>Review team</th>
<th>No of reviews</th>
<th>Team lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Adelaide</td>
<td>3</td>
<td>Zohra Lassi</td>
</tr>
<tr>
<td>University of Newcastle</td>
<td>2</td>
<td>Luke Wolfenden</td>
</tr>
<tr>
<td>University of Sydney</td>
<td>1</td>
<td>Katie Conte</td>
</tr>
<tr>
<td>University of Toronto</td>
<td>1</td>
<td>Peter Newman</td>
</tr>
<tr>
<td>University of Melbourne</td>
<td>2</td>
<td>Sharon Licquish</td>
</tr>
<tr>
<td>Aga Khan University</td>
<td>4</td>
<td>Jai Das</td>
</tr>
<tr>
<td>Review team</td>
<td>No of reviews</td>
<td>Team lead</td>
</tr>
<tr>
<td>--------------------------------------------</td>
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<td>-----------------</td>
</tr>
<tr>
<td>Centre for Evidence and Implementation</td>
<td>2</td>
<td>Bianca Albers</td>
</tr>
</tbody>
</table>

*Covidence* will be the joint work platform for these review teams. The Centre for Evidence and Implementation (CEI) will be responsible for administering the literature searches and supporting review teams in their use of *Covidence*.

Upon de-duplication, studies will be uploaded to *Covidence*, and review teams assigned to PICOS. During title and abstract screening, two reviewers will independently screen each study for inclusion. Any disagreements will be resolved by the review team lead (as per table 6 above).

The full texts of agreed citations will be retrieved and uploaded to *Covidence*.

Two independent reviewers will screen full texts for inclusion. Any discrepancies will be resolved by the responsible review team lead.

As part of the screening process, the research team will establish a cross-PICO mechanism for passing excluded studies from one review to another. This will ensure that a reviewer, who works on one PICO and identifies and excludes a study of potential relevance to another PICO passes this study on to the relevant PICO team. This will create an additional layer of security that relevant studies will not be missed.

The final selection of included studies will be prepared for data extraction to be conducted independently by each review team.

### 3.6. Data extraction

The review teams will use a standardised approach to extracting data from included studies. The components of this extraction will be modified based on the final included studies and may differ between different questions/topics. At a minimum, the following general information will be extracted from each study.

- **Study details**, including:
  - author, year, location, study design, delivery setting (high versus low and middle income; community or health facility; etc.), sector (primary or secondary health; allied health; etc.), participants (type of CHW and others), sample size
- **Intervention details**, including:
  - Interventions delivered (programmes, practices), core components of interventions, delivery mode and location, other characteristics as relevant
- **Outcomes**
  - for quantitative studies, we will extract data related to each outcome accordingly. We will report measures of intervention effects in the same way the study authors have reported. If necessary, comparisons will be made using standardised measures of effect such as mean standardised difference (SMD) or Odds Ratios (OR). We may also use a standardised scale to facilitate comparisons across studies along the dimension of quality.
  - For qualitative studies, we will extract the major themes reported by the study authors.

In addition to this general data extraction, each PICOS implies the extraction of data specifically tailored to the different research questions. Table 6 below lists information that, if present in a
Table 6: PICOS specific data extraction

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Potential stratifiers for sub-group analysis</th>
</tr>
</thead>
</table>
| Q 1: In CHWs being selected for pre-service training, what strategies for selection of applications for CHWs should be adopted over what other strategies? | Literacy level based  
Gender based  
Marital status based  
Age based  
Membership of the community of interest  
Preference to volunteer  
Preference for certain type of work by potential CHWs  
Availability of time |
| Q 2: For CHWs receiving pre-service training, should the duration of training be shorter versus longer? | Training depending on the complexity of the task (i.e. promotive, preventative, data collection, health education) |
| Q 3: For CHWs receiving pre-service training, should the curriculum address specific versus non-specific competencies | Technical competencies for CWEs that will work in biological or medical environments (i.e. basic human physiology for identifying issues and arranging referrals, basic pharmacology for identifying vitamin supplements)  
Counselling and motivational skills  
Understanding of the health system to direct patients  
Basic knowledge and skills about household preventative habits |
| Q 4: For CHWs receiving pre-service training, should the curriculum use specific delivery modalities versus not? | Face to face delivery  
Classroom delivery  
Electronic, web-based, telephone, paper-based training  
Training in community or an educational facility away from the community |
| Q 5: In CHWs who have received pre-service training, should competency-based formal certification be used versus not used? | Formal certification/accreditation  
Competency based  
Approval of regulatory bodies, government authorities, approval by academic institutions |
| Q 6: In the context of CHWs programmes, what strategies of supportive supervision should be adopted over what other strategies? | Coaching  
Supervisor-supervisee ratios  
Checklists  
Category of supervisors (dedicate, non-dedicated, peers as supervisors)  
Supervisor visits, observation |
| Q 7: In the context of CHWs programmes, should practicing CHWs be paid for their work versus not? | Payments  
Salary  
Remuneration package  
Formal contract  
Absorption into health force |
| Q 8: In the context of CHWs programmes, should practicing CHWs have a career ladder opportunity/framework versus not? | Career ladder / pathways  
Career opportunities  
Promotions |
| Q 9: In the context of CHWs programmes, should practicing CHWs have a formal contract versus not? | Formal contract  
Written document  
Legal contract/document  
Document issued by a formal authority stipulating working conditions, rights and responsibilities, job description or terms of remuneration (if any) |
| Q 10: In the context of CHW programmes, should there be a target population size versus not? | Threshold size for the target population  
Caseload information |
| Q 11: In the context of CHWs programmes, should practicing CHWs collect, collate, and use health data versus not? | Collection and submission of data during their routine activities  
e-health data collection and transmission platforms  
The data may be used to receive feedback and supervision and motivation |
<p>| Q 12: In the context of CHWs | Single cadre of CHWs |</p>
<table>
<thead>
<tr>
<th>Research Question</th>
<th>Potential stratifiers for sub-group analysis</th>
</tr>
</thead>
</table>
| Q 13: In the context of practicing CHW programmes, are community engagement strategies effective in improving CHW program performance and utilisation? | Two or more cadres CHWs  
Multi cadre CHWs  
Engagement with:  
- community health committees  
- village development committees  
- community liaison committees  
- facility-liaison committees  
- hygiene and sanitation committees  
- mothers’ groups  
- fathers’ groups  
- youth groups  
- religious groups  
- support groups  
- savings and credit or farmers’ groups  
- community health action planning activities  
- involvement of community representatives in decision making, planning and, budgeting processes |
| Q 14: In the context of CHWs programmes, should practicing CHW mobilize wider community resources for health vs. not? | Some of the activities the studies may report on the engagement of CHWs in the community:  
- identifying priority health and social problems  
- mobilizing and helping coordinate relevant, local resources representing different stakeholders, sectors and civil society organizations to address priority health problems  
- participating in evaluating and disseminating outcomes of interventions  
- strengthening linkages between community and health facility |
| Q 15: In the context of practicing CHWs programmes, what strategies should be used for ensuring adequate availability of commodities and consumable supplies over what other strategies? | Inclusion of relevant commodities in the programme (e.g. condoms in sexual health programmes)  
- Maintenance and management of stocks using basic procedures  
- Making sure to replenish stock through re-supply procedures  
- Use of social media to inform community  
- Co-ordination, supervision and standardization of resupply procedures, checklists and incentives  
- Use of mobile phone applications |

3.7. Data synthesis

If possible and relevant, meta-analyses will be conducted to obtain an overall estimate of the effect of an intervention when more than one study has examined similar interventions using similar methods, the studies have been conducted in similar populations, and outcomes were measured and are similar. For each meta-analysis, we will test for heterogeneity and, if present, will use a random-effects model for synthesis.

For qualitative studies, we will conduct a narrative synthesis, grouping the findings by the type of intervention, population, delivery context and outcome(s).

Furthermore, relevant stratifiers such as

- Volunteer vs. paid;
- Level of training;
- Polyvalent vs. monovalent;
- Full time vs part time;
- Expert client/patient;
- Type of CH work [preventive/promotive/curative]
will be included as part of sub-group analyses. Not all literature may allow for this analyses but to
the degree possible, the research team will emphasise this part of the analysis.

The process of data synthesis will involve the utilisation of the GRADE\textsuperscript{19} (Grading of
Recommendations Assessment, Development and Evaluation) approach, a well-developed formal
process to rate the quality of scientific evidence in systematic reviews.

The goal of assessing the strength of the evidence identified through included studies is to provide
clearly explained, well-reasoned judgments about reviewers’ confidence in their systematic review
conclusions so that decision makers in developing guidelines can use them effectively\textsuperscript{17,18}.

Grading the strength and quality of evidence requires assessment of within-study risk of bias
(methodological quality), directness of evidence, heterogeneity, precision of effect estimates and
risk of publication bias\textsuperscript{15}. 
4. References


Our mission
We are dedicated to using the best evidence in practice and policy to improve the lives of children, families and communities facing adversity.

How we achieve this
We work with a diverse range of key stakeholders who want to achieve social impact for children and families facing adversity. We bring specialist skills in:

- Supporting sustained change in the behaviour of systems, organisations and individuals. We put a strong emphasis on supporting and strengthening the core components of effective program implementation.
- Providing knowledge translation to policymakers, and relevant stakeholders, so they can access and use research for evidence-informed decision-making.
- Program design - selecting and creating evidence-informed programs and services to achieve outcomes for children, family and communities.
- Conducting rigorous evaluations, and assessing the long-term effect of outcomes.

Working with us
Through national and international collaborations, we conduct a range of activities to achieve our mission.

Centre for Evidence and Implementation
Level 6, 250 Victoria Parade, East Melbourne VIC 3002
Web: cei.org.au
Twitter: @CEI_org