Applying systems thinking to task shifting for mental health using lay providers: a review of the evidence

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Objective. This paper seeks to review the available evidence to determine whether a systems approach is employed in the implementation and evaluation of task shifting for mental health using lay providers in low- and middle-income countries, and to highlight system-wide effects of task-shifting strategies in order to better inform efforts to strengthen community mental health systems.

Methods. Pubmed, CINAHL, and Cochrane Library databases were searched. Articles were screened by two independent reviewers with a third reviewer resolving discrepancies. Two stages of screens were done to ensure sensitivity. Studies were analysed using the World Health Organization’s building blocks framework with the addition of a community building block, and systems thinking characteristics to determine the extent to which system-wide effects had been considered.

Results. Thirty studies were included. Almost all studies displayed positive findings on mental health using task shifting. One study showed no effect. No studies explicitly employed systems thinking tools, but some demonstrated systems thinking characteristics, such as exploring various stakeholder perspectives, capturing unintended consequences, and looking across sectors for system-wide impact. Twenty-five of the 30 studies captured elements other than the most directly relevant building blocks of service delivery and health workforce.

Conclusions. There is a lack of systematic approaches to exploring complexity in the evaluation of task-shifting interventions. Systems thinking tools should support evidence-informed decision making for a more complete understanding of community-based systems strengthening interventions for mental health.

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Key words: Community, health system, mental health, systems thinking, task-shifting.

Introduction
Globally, mental health accounts for a large and growing burden of disease (Whiteford et al. 2013). Recent estimates from the WHO Mental Health Surveys indicate an interquartile range of lifetime DSM-IV disorder prevalence between 18.1% and 36.1% (Kessler et al. 2009). According to the Global Burden of Disease Study, between 2005 and 2013, disability-adjusted life-years attributed to mental and neurological disorders increased by 9.7% and 16.1%, respectively (Murray et al. 2015a). Despite this burden, a study across 17 countries demonstrated that only 20% of persons with common mental disorders (CMDs) received treatment in the year prior to the survey, with only 10% receiving minimally adequate treatment (Wang et al. 2013).
Recognizing task shifting as a system intervention for mental health

In resource-poor settings, task shifting has been an effective approach to addressing health workforce challenges and strengthening systems for mental health (Eaton et al. 2011; Kakuma et al. 2011). Several systematic reviews have supported the use of task shifting for mental health focused on specific populations, such as with people living with HIV/AIDS or mothers with postpartum depression (Rahman et al. 2013; van Ginneken et al. 2013; Chowdhary et al. 2014; Atif et al. 2015; Chibanda et al. 2015). Task shifting includes shifting service delivery of specific tasks from professionals with higher qualifications to those with fewer qualifications or creating a new cadre with specific training (WHO, 2007b). It is meant to alleviate the heavy workload of specialists and to ensure that those with no access to specialists have a means of accessing some level of mental health services (Patel et al. 2007). By shifting service delivery for less complex cases to lay providers, the system allows mental health specialists to focus on more complex cases with the hope that quality of care delivery will also improve (Weinmann & Koesters, 2016).

Task shifting requires various parts of the system to be working in harmony in order to be successful (GHWA, 2007; Yaya Bocoum et al. 2013). Conditions such as regular supervision, availability of resources and tools, access to medicines, quality training, and exposure to technological updates through in-service training are enabling factors in ensuring successful redistribution of tasks among health workforce teams (Yaya Bocoum et al. 2013; Agyapong et al. 2016). Buy-in and acceptance of task-shifting interventions across a wide range of stakeholders is also important in their success (Yaya Bocoum et al. 2013). For example, perceptions of a loss of hierarchal structures, shift in earnings, and burden of supervision are examples of barriers that higher professional cadres may experience regarding task shifting (Niekerk, 2008; Philips et al. 2008; Zachariah et al. 2009). Therefore, task shifting is a system-wide intervention that has implications beyond the players and programmes directly involved in its implementation; it reallocates resources across the health system to trigger change.

Using systems thinking to evaluate the impact of task shifting

With the recognition that task shifting for mental health is a system-wide intervention, understanding its potentially far-reaching implications and impact across the system becomes valuable for appropriate decision making, health system planning, and implementation of interventions. System-wide effects can be captured using the suite of tools available in systems thinking to collect information across a multitude of stakeholders and mechanisms involved in a given context (AHPSR, 2009; Peters, 2014). The six building blocks of the health system – service delivery, health workforce, information technology, medical products,
financing, and leadership – are made dynamic, adaptive, and interactive through a systems thinking lens as it is designed to explore how different elements are connected in a system and the impact and implications of these connections (Table 1) (Adam et al. 2012). Systems thinking also incorporates another key health systems element: communities and people (Adam et al. 2012). Therefore, in our application of the building blocks approach, we have added a seventh to account for communities and people. By enhancing understanding of different perspectives across multiple interacting agents, the changing context in which they interact, and the changes resulting from new patterns created over time, systems thinking can serve as an important policy toolkit (Adam et al. 2012; Peters, 2014).

Applying evidence for success in capacity building for mental health care

The growing burden of disease attributed to mental health calls for approaches that strengthen the capacity of the health system to equitably and appropriately address the wide range of mental and neurological disorders (Whiteford et al. 2013). The mhGAP (Global Mental Health Gap Action Programme) was launched in 2008 to provide technical guidance, tools and training to help address the challenges of availability in resource-poor settings (WHO, 2008). Global mental health has seen attention in academic circles through special series in The Lancet and PLoS, which highlight integration of mental health into primary care as a key strategy (Patel et al. 2007; Patel & Thornicroft, 2009).

Integration of mental health into health systems, especially in primary care systems, is not without its challenges, particularly in resource-poor settings (Patel et al. 2010a; Eaton et al. 2011; Weimann & Koesters, 2016). Poor policy implementation, inadequate human resource allocation to support the process, poor community engagement, and low access to medicines are among the challenges of integration (Patel et al. 2007; Eaton et al. 2011; van Ginneken et al. 2013). Systems thinking contributes to documenting the system-wide impact of a given intervention, as well as enhancing the ability to predict both intended and unintended consequences of the intervention, critical in designing successful large-scale reform.

Few studies focus on the wider impact of task shifting across the health system and, likewise, the scale-up of mental health strategies (Eaton et al. 2011; Yaya Bocoum et al. 2013). This weakness in the literature undermines the complexity of interactions and changes that take place in health systems, and stymies the potential scale-up and sustainable integration of promising task-shifting strategies (Adam et al. 2012; Yaya Bocoum et al. 2013). To ensure that LMICs can expand large-scale mental health strategies and achieve integration into primary care, a system-wide approach can be an effective tool in understanding, evaluating, and implementing bespoke strategies (WHO, 2007b; AHPSR, 2009). This paper reviews the available evidence to determine whether a systems approach is employed in the implementation and evaluation of task shifting for mental health using lay providers in LMICs. It seeks to highlight system-wide effects of task-shifting strategies in order to better inform efforts to strengthen community mental health systems.

Methods

Search strategy

The electronic databases of PubMed, CINAHL, and Cochrane were searched between 5 September 2016 and 30 October 2016 (Annexure 1). The search strategy consisted of three concepts: (1) lay providers, including community health workers, health aides, local references to community health workers such as accredited social health activists, non-physician health workers, community-based practitioners, and other associated terms; (2) mental health, including the standard set of disorders under the definition of CMDs such as anxiety, depression, dementia, schizophrenia, and substance abuse, as well as strategies for treatment such as supportive counselling, cognitive behavioural therapy, and others; and (3) LMIC setting, as this study is focused on alternatives for delivery of mental health services in resource-poor settings. These concepts were expanded to include similar terms and combined using ‘and’ to build the search. Further, the references of included articles were searched to identify additional citations that were not captured in the search as a means of ensuring the robustness of the study. These were included when the full text satisfied the inclusion criteria of being set in an LMIC, focusing on mental health and evaluating a task-shifting strategy of service delivery from providers with higher or more specialized qualifications to those with lower qualification. However, all eligible references were already captured in the search. Search was limited to publications between January 1996 and September 2016.

After completing the electronic search, the titles and abstracts of all identified articles were independently reviewed by two authors, who assessed whether the article should be included or excluded according to predefined criteria. These criteria are included in Table 2. Articles that met any of the criteria for exclusion were eliminated. In the first round of screening,
| Building block         | Defining characteristics                                                                                                                                   | Source of data                                      |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Service delivery       | Considers comprehensiveness of services provided, accessibility, coverage, continuity of high-quality, person-centred care across network of services, and efficient and accountable management of these services | Routine health facility monitoring systems          |
|                        |                                                                                                                                                               | Health facility surveys and assessments             |
| Health workforce       | Encompasses ‘workers in different domains of health systems, such as curative, preventive and rehabilitative care services as well as health education, promotion and research’. (WHO, 2010) | Population census                                  |
|                        | Related data needed for effective management includes comprehensive, reliable, timely information on numbers, demographics, skills, services being offered, and factors influencing recruitment and retention (payment structures, treatment, supervision, training, work burden, work environment, skill-mixing, etc.) of human resources for health | Labour force survey                                 |
|                        |                                                                                                                                                               | Health facility assessment                         |
|                        |                                                                                                                                                               | Civil services payroll registry                     |
|                        |                                                                                                                                                               | Registries of professional regulatory bodies       |
| Health information     | Functional health information systems exist where countries have: health survey plans that cover all priority health topics, two or more data points available for maternal mortality, child mortality, coverage, smoking and nutrition; birth and death registrations; ICD-10 used in district hospitals to report on deaths; census completed; HIV prevalence; health facility data; data quality assessment reports; health statistics web site; national health accounts exercise; health systems performance assessment; and institutional mechanisms for analysis of health data. | Health surveys                                      |
| systems                |                                                                                                                                                               | Birth and death registration                       |
|                        |                                                                                                                                                               | Census                                             |
|                        |                                                                                                                                                               | Health facility reporting                          |
| Medicines and          | Considers ‘equitable access to essential medical products, vaccines and technologies of assured quality, safety, efficacy and cost effectiveness, and their scientifically sound and cost-effective use’. (WHO, 2010) | Facility surveys                                   |
| medical devices        | Aspects that impact access include: national policies and guidelines, price negotiation, reliable manufacturing practices, effective procurement, supply and storage, distribution systems, leakage protection, support for rational use, and awareness-raising for both providers and patients | Essential medicines lists                          |
|                        |                                                                                                                                                               | Key informant interviews and surveys               |
|                        |                                                                                                                                                               | Legislative review                                  |
|                        |                                                                                                                                                               | Household surveys                                   |
| Financing              | ‘Concerned with the mobilization, accumulation and allocation of money to cover the health needs of the people, individually and collectively, in the health system… the purpose of health financing is to make funding available, as well as to set the right financial incentives to providers, to ensure that all individuals have access to effective public health and personal health care’ (WHO, 2010) | National health accounts                           |
|                        |                                                                                                                                                               | Household expenditure surveys                       |
|                        |                                                                                                                                                               | Health insurance enrolment records                 |
|                        |                                                                                                                                                               | Government expenditure accounts                    |
| Leadership and         | Considers ‘strategic policy frameworks […] combined with effective oversight, coalition-building, regulation, attention to system design and accountability’. (WHO, 2010) | National health policy reviews                      |
| governance             |                                                                                                                                                               | Rule-based indicators: existence of specific policies |
|                        |                                                                                                                                                               | Outcome-based indicators: span across other building blocks for good performance overall            |
| Community and people   | Considers community voice, engagement and consultation. Includes context-specific considerations based on the community’s needs | Community meetings; programme implementation documents |
articles meeting at least four of five criteria for inclusion based on titles and abstract review, were included. In the case of inter-rater disagreement, a third reviewer was consulted on the inclusion or exclusion of the article in question. The third reviewer was blinded and has expertise in health systems research. Articles intended for inclusion were combined in a Microsoft Excel spreadsheet and any duplicates were removed. Full-text versions of identified articles were examined in order to reassess inclusion based on articles meeting all five criteria before establishing the final set to be included in the study. A two-stage approach to inclusion was employed to ensure sensitivity.

For inclusion in this review, the study must have: (1) evaluated the implementation and/or impact of an intervention; (2) had significant focus on mental health; (3) been set in an LMIC; (4) employed task-shifting strategies where service delivery was transformed from a professional cadre with higher qualifications and minimal mental health training; and (5) involved training of lay providers limited to fewer than 3 years. The training criteria was articulated with input from a health workforce specialist in order to keep the focus on task shifting to providers with fewer qualifications without excluding task shifting to qualified providers who lack specialized mental health training as we considered this relevant to our study. Where length of training was not specified, we used our collective judgment to determine whether task shifting was towards a provider with minimal mental health training. An expanded interpretation of evaluation was used to include both quantitative and qualitative studies that reported on randomized control trials, cohort studies with before and after measures, survey and/or observational assessments of stakeholder perceptions, acceptability and satisfaction, case studies, and analysis of qualitative data.

Data extraction and analysis

Two study authors read all included full texts and extracted the following data: setting, year of publication, aim of study, type of intervention, sample size, outcomes measured, results, health system implication(s), and barriers and facilitators of implementation. Critical Appraisal Skills Programme (CASP) tools were used to assess the quality of the studies (CASP, 2016). The initial screening questions (see Table 3) were used to ensure that included studies met minimal quality standards. Risk of bias and limitations of included studies were then assessed using more detailed items found on CASP checklists for different types of studies (see Table 4).

| Screening question                                      | Considerations                                                                 |
|--------------------------------------------------------|-------------------------------------------------------------------------------|
| Was there a clear research question/objective?         | What was the goal of the research?                                            |
|                                                        | Why was it thought important?                                                 |
|                                                        | Is the question focused in terms of the population, risk factors, and/or     |
|                                                        | outcomes studied?                                                            |
| Was the methodology/research design used appropriate to | Do authors provide justification for the research design?                    |
| address the aims of the research?                      | Are there selection bias and/or generalizability issues?                     |
|                                                        | Were effects of the intervention identified, measured, and valued appropriately? |
To determine whether a system-wide approach was taken in the evaluation of the intervention and to identify system-wide effects when available, authors identified features of interventions relevant to the WHO building blocks framework as well as systems thinking characteristics used in the study (AHPSR, 2009). Systems thinking characteristics considered included: capturing perceptions and interactions of multiple interacting agents, network analysis, mapping of contextual factors, process mapping, describing feedback mechanisms, and other approaches that could inform system dynamics modelling (Peters, 2014). Manuscripts were coded for identification of barriers, facilitators, and outcomes that were relevant to each of the six building blocks: (1) Service Delivery, (2) Health Workforce, (3) Information Technology, (4) Medicines & Medical Devices, (5) Financing, and (6) Leadership and Governance (WHO, 2007a). A seventh building block for communities and people was also included in data abstraction. Authors also made note of the range of stakeholders consulted in the study. The building blocks model allowed for a systematic way to determine whether the impact of the intervention was assessed beyond the specific building blocks in which they were implemented (i.e. health workforce and service delivery in the case of task shifting for mental health). By looking at the level and range of stakeholder engagement, we were able to identify instances were roles and interactions of stakeholders not directly involved in the intervention were explored, as is customary in systems thinking. Use of system dynamics theory, causal loop diagrams, and other system modelling techniques were also included in the extraction criteria, but none were found.

Results

From the 1357 papers identified, 817 were found through PubMed, 271 from Cochrane Library, and 269 from CINAHL. Removing 249 duplicates, 1108 papers were screened based on titles and abstracts. Of these, 147 met the criteria for the first stage of inclusion (four out of five criteria for inclusion met). Upon reviewing full texts, a final set of 30 papers were
included although two of these reported on the same randomized controlled trial on MANAS in India (Patel et al. 2010b, 2011), and three were based on different perspectives of the community mental health programme in Ghana (Agyapong et al. 2015a, b, 2016). No studies were excluded on the basis of quality. See Fig. 1 for search outcomes.

Thirteen papers were qualitative evaluations using surveys, interviews, focus groups, action research, implementation research, or case study methodology (Ali et al. 2010; Petersen et al. 2011; Thurman et al. 2014; Agyapong et al. 2015a, b, 2016; Larson-Stoa et al. 2015; Lorenzo et al. 2015; Magidson et al. 2015; Nimgaonkar & Menon, 2015; Abas et al. 2016; Wright & Chiwandira, 2016). Twelve papers were randomized controlled trials (Ali et al. 2003; Baker-Henningham et al. 2005; Rahman et al. 2008; Kumakech et al. 2009; Patel et al. 2010b, 2011; Tomlinson et al. 2011; Chatterjee et al. 2014; Pradeep et al. 2014; Rotheram-Borus et al. 2015). Three papers were pre/post- or prospective cohort studies (Adam et al. 2012; Whiteford et al. 2013; Yaya Bocoum et al. 2013; Hung et al. 2014; Padilla et al. 2015). Two papers included economic evaluation (Buttorff et al. 2012; Chatterjee et al. 2014). All studies showed that task shifting for mental health was feasible and acceptable in the given contexts; however, perceptions of quality of care provided by lay providers remain uncertain (Patel et al. 2011; Petersen et al. 2011; Rotheram-Borus et al. 2015; Agyapong et al. 2016). A meta-analysis of outcome measures was not done as the interventions were diverse, conducted at multiple scales, and included qualitative evaluations of stakeholder perceptions. See Table 5 for characteristics of included studies.

Studies were conducted in India, Ghana, Zimbabwe, Pakistan, Malawi, South Africa, Uganda, Indonesia, Iraq, Argentina, Botswana Jamaica, Ethiopia, Zambia, and Thailand, primarily at the district (includes village) level (see Table 5). Across these different contexts, community mental health programmes were variable in nature with some being more integrated into existing health systems (Patel et al. 2010b, 2011; Petersen et al. 2011; Mendenhall et al. 2014; Agyapong et al. 2015a, b; Nimgaonkar & Menon, 2015; Agyapong et al. 2016; Wright & Chiwandira, 2016). Others were more programme-specific in nature and targeted specific at-risk populations, such as mothers suffering from depression, people living with HIV/AIDS,
## Table 5. Characteristics of included studies

| Author | Type of evaluation | Setting | Type of lay provider | Type of service provided | Sample size | Findings |
|--------|--------------------|---------|----------------------|--------------------------|-------------|----------|
| Abas et al. (2016) | Case study: acceptability and implementation | Zimbabwe | Lay health worker (LHW) | LHWs carry out structured psychosocial assessment and a screen test, following it up with advice, discharge, problem-solving therapy (PST), or referral. Where clients are suffering from socioeconomic problems, LHWs may refer to income-generating projects also taking place in collaboration with the Friendship project. | Six staff interviews; six patient interviews; five focus groups with 8–12 per group | A collaborative care intervention, including screening, PST and referral for depression and other CMDs is positively received by patients (happier, valued, less stigmatized, less lonely), rewarding for female community LHWs to deliver, and can be sustained over time at low cost. Sharing similar socioeconomic backgrounds with their clients enabled LHWs in establishing more productive relationships with their clients and improved service delivery. |
| Agyapong et al. (2015b) (I) | Perceptions survey tool and qualitative analysis | Ghana | Community mental health workers (CMHWs) (includes community psychiatric nurses, community mental health workers and clinical psychiatry officers) | Different cadres of CMHWs support mental health work and refer to psychiatrists where necessary. Community Mental Health Officers (CMHOs), the least specialized cadre, are meant to detect cases and not diagnose or treat; however, due to workforce shortage, they often do both | Eleven psychiatrists, 26 health policy directors, 164 CMHWs | CMHWs are not seen as undermining the role of psychiatrists and find it easy to refer major cases; however, due to the shortage of psychiatrists and the geographic barriers, referrals do not always take place, making it necessary to both better train CMHWs for role clarity, and to increase the numbers of psychiatrist available for supervision. Over the 7-year period studied, LHWs were making fewer referrals as they had gained more confidence in the scope of their practice. CMHWs believe that patients and other healthcare workers have concerns about the quality of care they provide. |
| Agyapong et al. (2015a) (II) | Perceptions survey tool and qualitative analysis | Ghana | CMHWs include community psychiatric nurses, community mental health workers and clinical psychiatry officers | CMHWs address conditions such as schizophrenia, psychosis, epilepsy, dementia, and other common mental illness. In addition, they perform health education tasks; reproductive and child health services; link to psychiatric services and patient advocacy regarding social services | 164 CMHWs | CMHWs work beyond the scope of their practice and training, they provide financial assistance to patients, and sometimes fill in at regional hospitals for general medical consultations. Less than a quarter of CMHWs work closely with a psychiatrist. CMHWs do not increase nor undermine the work of psychiatrists. Community Mental Health Officers (CMHOs), meant to detect cases, are often treating and prescribing medicines, which is beyond the scope of their practice and should be addressed by either enhancing the scope of their training or ensuring availability of other cadres of health workers to cover tasks not meant to be covered by non-specialized health workers. CMHWs are integrated in Ghana’s health system; however collaboration with traditional or religious healers is minimal, even though these stakeholders are important community sources of care seeking. |
| Study                        | Type                        | Country | T Iran | Description                                                                                                                                                                                                 | Findings                                                                                                                                                                                                 |
|------------------------------|-----------------------------|---------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Agyapong et al. (2016)       | Perceptions survey tool and qualitative analysis | Ghana   |        | CMHWs include community psychiatric nurses, community mental health officers and clinical psychiatry officers. CMHO training programmes introduced in 2010 to address the gap in mental health services. CMHOs have shorter training than other CMHWs and are not meant to diagnose, treat or prescribe medicines, but do so regularly due to shortages. | Eleven psychiatrists, 29 health policy directors, 164 CMHWs. There is a gap in training and supervision and a disconnect between what psychiatrists and health policy directors perceive to be available to CMHWs and what is available to them in reality. Many CMHWs are working beyond the scope of their practice with inadequate training and supervision afforded to them. Further investment in supervision and training is necessary. |
| Ali et al. (2003)            | Randomized controlled trial  | Pakistan |        | Women briefly trained from the same community Supportive, problem-solving counselling was provided to women with depression in their homes for eight sessions.                                                                 | 124 depressed women. Based on AKUADS (Aga Khan University Anxiety and Depression Scale) score, there was a net reduction in anxiety and depression of 21% in the intervention arm. |
| Ali et al. (2010)            | Quasi-experimental action research | Pakistan |        | Women community health workers (CHWs) CHWs would visit the home of new mothers to offer basic cognitive behavioural therapy, and provide supportive and problem-solving counselling. CHWs later discussed these with a clinical psychologist on a weekly basis. Those with more serious cases were referred for treatment. Instruction on healthy child-rearing practices was also provided. | 102 postpartum women with depression. AKUADS (Aga Khan University Anxiety and Depression Scale) scores dropped more for counselled v. not counselled group; however, both groups experienced declines in depression possibly due to general support provided in parenting and child-rearing practices. |
| Baker-Henningham et al. (2005) | Randomized controlled trial  | Jamaica  |        | Community health aides visited mothers’ homes weekly for a half-hour, demonstrating activities that engaged both parent and child and supporting parenting competence; in addition, they provided counselling and problem solving even though these were not explicitly included in the intervention. | 139 mothers with undernourished children. Significant decline in depressive symptoms was reported in mothers receiving home visit with those receiving 40–50 visits benefitting the most (compared with fewer visits). |
| Bolton et al. (2014)         | Randomized controlled trial  | Thailand |        | Lay counsellors Lay counsellors provided a Common Elements Treatment Approach (CETA) to Burmese survivors of imprisonment, torture and related trauma. Transdiagnostic interventions capitalize on commonalities across evidence-based treatments instead of having one particular focus, making them more response to cross cutting needs using decision rules and guidelines, with flexibility for contextual differences. | 247 participants (intervention n = 182; wait list controlled n = 165). CETA participants experienced improvements in all outcomes, including depression, post-traumatic stress, functional impairment, anxiety, and aggression. |
| Author                  | Type of evaluation               | Setting      | Type of lay provider | Type of service provided                                                                 | Sample size        | Findings                                                                                                                                 |
|-------------------------|----------------------------------|--------------|----------------------|------------------------------------------------------------------------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Buttorff et al. (2012)  | Economic evaluation              | India        | Lay health worker    | Collaborative stepped care for CMDs using: (1) lay health workers in primary care settings trained to provide psychosocial services, (2) physicians already in the clinic, and (3) mental health specialists making monthly visits. Intensity of care provided was matched with severity of disorder to optimize human resource allocation. Subjects were taught stress reducing strategies and provided with tailored information and access to relevant networks and support organizations. Case management and proactive monitoring formed the basis of the intervention. | 1648 people with anxiety/depression | In public facilities, patient in the intervention arm showed improved health outcomes and lower time costs; health system costs were similar across intervention and control groups. |
| Chatterjee et al. (2014)| Randomized controlled trial & economic evaluation | India        | CHWs                 | Collaborative community-based care: treatment plans, psychoeducational material to patients, adherence management, peer support, rehabilitation, health promotion for physical ailments, and network links to community agencies to address social, legal, and economic challenges. This package of services was delivered by CHWs in three phases: (1) the intensive engagement phase (0-3 months), including six to eight home visits made by CHWs; (2) the stabilization phase (4-7 months), with sessions delivered once every 15 days; and (3) the maintenance phase (8-12 months), with sessions delivered once a month. | 282 schizophrenic patients | Collaborative community-based care including supervised CHWs was more effective than facility based services for people with moderate to severe schizophrenia, especially for overall disability. No effect was observed for stigma. Costs were greater in intervention with a third attributed to supervision costs. |
| Hung et al. (2014)      | Prospective cohort study         | South Africa | CHWs                 | Task shifting for screening of depression among pregnant women                             | 361 postpartum women | The study demonstrated the feasibility of incorporating depression screening into CHWs’ routine workflow |
| Study | Design | Country | Intervention Details | Sample Size | Findings |
|-------|--------|---------|----------------------|-------------|----------|
| Kumakech et al. (2009) | Cluster randomized controlled trial | Uganda | Peer group support with teachers as facilitators, AIDS counselling with two peer group sessions per week: share fears, worries and concerns, problem identification and problem solving | 326 children aged 10–15 years (intervention group n = 159 orphans, control n = 167 orphans) | After adjusting for baseline scores, follow-up scores for the intervention group in comparison with controls showed significant improvement in depression, anger, and anxiety, but not for self-concept. This study demonstrated that peer-group support intervention decreased psychological distress, particularly symptoms of depression, anxiety and anger. |
| Larson-Stoa et al. (2015) | Programme evaluation study through routine data collection | Indonesia | Paraprofessionals, Psychosocial group and individual counselling programme lasting 3 months with follow-up for victims of torture | 178 participants | The results indicated the participants’ anxiety symptoms, depressive symptoms, somatic symptoms, and functioning improved from the intake to the follow-up. The programme appeared to have been effective in reducing participants’ symptoms and impairment in functioning. |
| Lorenzo et al. (2015) | Qualitative (in-depth interviews, with an inductive and interpretative phenomenological approach used to analyse data) | South Africa, Botswana, and Malawi | Community disability worker (CDW), Community-based rehabilitation involving: (1) integrated management of health conditions and impairments with a strong family focus, (2) negotiating disability-inclusive community development, and (3) coordinated and efficient intersectoral management systems for disability inclusion | Sixteen CDWs who had at least 5 years’ experience of disability-related work in a rural area | Three main themes with sub-categories emerged demonstrating the competencies of CDWs. First, integrated management of health conditions and impairments within a family focus comprised ‘focus on the functional abilities’ and ‘communication, information gathering and sharing’. Second, negotiating for disability-inclusive community development included four sub-categories, namely ‘mobilizing families and community leaders’, ‘finding local solutions with local resources’, ‘negotiating retention and transitions through the education system’ and ‘promoting participation in economic activities’. Third, coordinated and efficient intersectoral management systems involved ‘gaining community and professional recognition’ and the ability to coordinate efforts (‘it’s not a one-man show’). The CDWs spoke of their commitment to fighting the inequities and social injustices that persons with disabilities experienced. They facilitate change and manage the multiple transitions experienced by the families at different stages of the disabled person’s development. |

(Continued)
| Author                  | Type of evaluation      | Setting                                      | Type of lay provider | Type of service provided                                                                 | Sample size | Findings                                                                                                                                                                                                 |
|------------------------|-------------------------|----------------------------------------------|----------------------|--------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Magidson et al. (2015) | Implementation research / case study | Iraq                                         | CHWs                 | Brief behavioural activation treatment for depression (BATD) was adapted with cultural modifications for low-literacy patient population and tailored training for non-specialist CHWs with little to no experience in behavioural therapies | Thirteen (11 CHWs, one study psychiatrist and one clinical supervisor, 107 patients received the intervention) | Of the 107 patients that received the intervention, there was 72% retention, and they completed all of the nine sessions. Case 1: despite challenges the client responded well to BATD. Client noted positive changes in her personal life. Case 2: client noted positive changes in her personal life and this was noted by her family members. Intervention was found to be acceptable and effective at reducing depressive symptoms and improving functioning |
| Mendenhall et al. (2014) | Implementation research (focus group discussions, in-depth interviews) | Ethiopia, India, Nepal, South Africa, and Uganda | CHWs                 | Packages of care at the community level focused on early identification, awareness raising, stigma reduction, increasing demand for appropriate mental health care, and addressing continuing care and social and economic needs of people with priority mental disorders | Seventy-seven CHWs, 110 community members, 80 service users and caregivers, 113 primary health care workers, 39 specialists and policy makers (36 focus groups, 164 in-depth interviews) | Task sharing mental health services is perceived to be acceptable and feasible in these LMICs as long as key conditions are met: (1) increased numbers of human resources and better access to medications, (2) ongoing structured supportive supervision at the community and primary care levels, and (3) adequate training and compensation for health workers involved in task sharing |
| Murray et al. (2015b)  | Randomized controlled trial | Zambia                                        | Lay counsellors      | Lay counsellor-provided trauma-focused cognitive behavioural therapy (TF-CBT) to address trauma and stress-related symptoms among orphans and vulnerable children                                                                 | 257 children (intervention group n = 131, control n = 126) | TF-CBT provided by lay counsellors decreased trauma and stress-related symptoms as measured by the UCLA Posttraumatic Stress Disorder Reaction Index and improved functional impairment for high levels of trauma |
| Murray et al. (2014)   | Implementation / operations research | Iraq & Thai/ Burma/ Border                    | Lay counsellors      | The study explored the implementation of a CETA, a transdiagnostic intervention for adults with mood or anxiety problems developed specifically for use with lay counsellors as opposed to single focus on evidence based treatments for one treatment category. CETA is a new approach to training of lay counsellors using decision rules based on evidence to guide selection and sequencing of treatment elements, allowing for flexibility in individual symptom presentation | Thirty-four counsellors; five supervisors | Lay counsellors were able to adhere to fidelity of the intervention while also using qualitative research findings and feedback into implementation design to account for cultural and contextual differences. The CETA approach allows counsellors to treat and manage clients’ symptoms while handling comorbidities and providing decision tools to help determine selection, sequencing and dosing in culturally-sensitive ways. Support through an apprenticeship model (supervision) ensured fidelity |
| Reference          | Study Design                           | Country       | Implementers                                      | Activities                                                                 | Participants/Outcomes                                                                 |
|--------------------|----------------------------------------|---------------|---------------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Neuner et al. (2008) | Randomized controlled trial              | Uganda        | Lay counsellors                                   | Lay counsellors (trained refugees) carried out manualized narrative exposure therapy and flexible trauma counselling (two treatment arms compared with a no treatment group) in a refugee settlement in Uganda, trained in a 6-week course | 277 Rwandan and Somali refugees. Over 6–9 months, refugees in the treatment arms had improved clinical and statistical scores on the post-traumatic stress diagnostic scale, also demonstrating improvements in physical health |
| Nimgaonkar & Menon (2015) | Implementation research and impact evaluation through survey, focus group, and routine data collection | India         | Village health workers and health animators       | Programme integrated into pre-existing comprehensive medical programme to identify and manage psychiatric disorders rapidly, comprehensively and sustainably. Village health workers and health animators followed up on activities cataloguing patients’ compliance, functionality and treatment regimen | The eligible Adivasi population was 13,345 at the beginning and 14,816 at the end of the programme. It was possible to train staff at all levels as the first step of an effort to integrate mental health into a comprehensive medical care programme that had previously focused solely on treatable acute and chronic medical disorders. The success of the programme is partly attributable to the pre-existing network of medical healthcare workers who were attuned to local cultural beliefs, the decentralization of healthcare and the mental health educational programmes. Surveys conducted before and after programme initiation also suggested improved knowledge, attitudes and acceptance of mental illness by the community. The annual per capita cost of the programme was 122.53 Indian Rupees per person per annum (USD 1.61) |
| Padilla et al. (2015) | Pre-/post-assessment                    | Argentina     | Health agents                                     | Annual training of health agents was instituted to better detect signs of mental illness and offer earlier treatment to reduce duration of untreated psychosis (DUP) | 672,260 population of province studied over 7 years for DUP. Consecutive years of training of health agents to improve screening and detection of mental illness, when coupled with an effective system to refer cases to specialty care, correlates with reductions in DUP in new cases detected in a rural environment |
| Patel et al. (2010)  | Randomized controlled trial              | India         | Lay health counsellor                             | Collaborative stepped care intervention with lay health counsellor          | 2,796 participants. Patients with ICD-10 CMDs were more likely to have recovered at 6 months of collaborative stepped care than the control. There was strong evidence of effect in public facility attenders and no evidence of effect in private facility attenders |
| Patel et al. (2011)  | Randomized controlled trial              | India         | Lay health counsellor                             | Collaborative stepped care intervention with lay health counsellor          | 2,796 participants. Prevalence of ICD-10 CMDs and the severity of symptoms of depression and anxiety in individuals attending public primary healthcare facilities with a CMD and in the subgroup of individuals with depression, over a 12-month period, was reduced using the MANAS collaborative stepped-care intervention led by lay health counsellors. Reduction in the risk of suicidal behaviours (plans or attempts) and disability days (days of no work or reduced work) and weaker effects on overall disability scores were also seen |

(Continued)
| Author                  | Type of evaluation                     | Setting                        | Type of lay provider | Type of service provided                                                                 | Sample size | Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|----------------------------------------|--------------------------------|----------------------|------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Petersen et al. (2011)  | Post-intervention process evaluation   | South Africa, Uganda           | CHWs                 | A common implementation framework using a multi-sectoral community collaborative, task-shifting, and self-help approach was used across both countries as part of the Mental Health and Poverty Project (MHaPP): (i) reorientation of district management towards integrated primary mental healthcare; (ii) establishment of community collaborative multi-sectoral forums; (iii) task shifting, which entailed establishing an expert consultancy liaison mental health team and training of general PHC staff and CHWs or equivalents in identification, management and referral of mental disorders; and (iv) promotion of self-help groups at the community level                                                                 | Qualitative process interviews with unspecified range of key stakeholders across both countries, focus group discussions, and use of meeting notes and observational data | Sensitization efforts were successful in allocating more resources to community mental health integration into primary care. Collaborative multi-sectoral forum was successful in mobilizing some extra resources to support mental health. Mental health training provided to CHWs strengthened their capacity to respond to psychosocial problems and related CMDs they encountered in their regular home visits. Further, referral pathways were strengthened in this programme. The common implementation framework supported both countries in successfully integrating mental health services into primary care even with different foci and resource availability across countries. However, task shifting was more successful in South Africa than in Uganda where resource limitations and inadequate mental health specialization from CHWs created bottle necks in service delivery and demoralized CHWs. It is therefore important to ensure that the system has safeguards in place to support task shifting. |
| Pradeep et al. (2014)   | Randomized controlled trial            | India                          | CHWs                 | Enhanced care by CHWs was provided to patients. CHWs visited patients immediately following the first medical consultation, educated the patient and her family members about depression and its treatment. This was followed by emphasis on adhering to treatment and medication regimen and at least four CHW visits as well as monthly physician consultation                                                                 | 260 adults with depression | Seeking and adhering to treatment was higher in the intervention group; however, there was no significant difference in severity of depression or quality of life between groups or between completers and dropouts at six months.                                                                                                                                                                                                                                               |
| Rahman et al. (2008)    | Cluster randomized controlled trial    | Pakistan                       | Lady Health Workers  | Trained lady health workers held a weekly session that included cognitive behavioural therapy for 4 weeks in the last month of pregnancy, three sessions in the first postnatal month, and nine 1-monthly sessions thereafter                                                                 | 1054 pregnant women | Integration of a cognitive behaviour therapy-based intervention into the routine work of CHWs more than halved the rate of depression in prenatally depressed women compared with those receiving enhanced routine care. In addition to symptomatic relief, the women receiving the intervention had less disability and better overall and social functioning, and these effects were sustained after 1 year.                                                                                                                                                                                                                                           |
| Study Authors          | Study Design                                   | Study Location  | Intervention Details                                                                                                                                                                                                 | Sample Size |
|------------------------|-----------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Rotheram-Borus et al. (2015) | Cluster randomized controlled trial            | South Africa    | Mentor Mothers (CHWs) were trained for 1 month in cognitive behavioural change strategies and role-playing. They were trained to provide and apply health information about general maternal and child health, HIV/TB, alcohol use, and nutrition to low-income, urban women's lives. | 1238 mothers |
| Thurman et al. (2014)   | Longitudinal quasi-experimental design: pre/post-assessment | South Africa    | Two models were tested: (1) home-visiting programmes that use a trained and compensated paraprofessional workforce and (2) programmes that rely on volunteers, who most often receive limited training and nominal incentives for their efforts. | 1487 children and 918 caregivers |
| Tomlinson et al. (2011) | Cluster randomized controlled trial            | South Africa    | Local women with good social skills (and mothers themselves) carried out the Philani intervention Programme, which consists of home visits with pregnant women and interventions to reduce alcohol misuse, increase adherence to perinatal HIV regimens, and boost child nutrition. CHWs were trained in: (1) cognitive-behavioural approaches to establishing healthy routines and to problem-solving around goal setting, choices, triggers, and shaping of desirable behaviours; (2) key information about general maternal and child health, techniques for framing each health issue that is a risk (nutrition, alcohol, and HIV), and strategies for applying the health information in families’ daily lives; and (3) coping with their own life challenges | 1238 pregnant women |

Despite not originally targeting reductions in maternal depression or improved maternal emotional health, the home-visiting intervention with urban South African mothers was associated with improved maternal emotional health 36 months after their children were born. CHWs encouraged and trained mothers to care for their infants, regardless of stress. Relative to standard care, intervention mothers were significantly less likely to report depressive symptoms and more positive quality of life at 36 months. Alcohol use was significantly related to use over time, but was also related to depression and HIV status at each assessment and associated with partner violence at 36 months. A more intensive and group-focused intervention is needed to address alcohol use.

No measurable reduction in psychological distress among children or caregivers served by parapersonals compared to volunteers was observed. Child behavioural problems, depression among boys, and family functioning were worse by follow-up, regardless of programme model.

Training CHWs as generalists appears to benefit child growth by preparing them to address the highest priority health issues, to address general maternal and child health, and to practice effective caretaking and problem solving.
orphans, refugees and torture survivors (Baker-Henningham et al. 2005; Neuner et al. 2008; Kumakech et al. 2009; Ali et al. 2010; Bolton et al. 2014; Murray et al. 2014; Larson-Stoa et al. 2015; Magidson et al. 2015; Murray et al. 2015b). Outcome measures used included mental health assessment tools, such as the 10-item Edinburgh Postnatal Depression Scale (EPDS-10), the Center for Epidemiological Studies Depression Scale (CES-D), Psychiatric Symptom Score, UCLA Post-Traumatic Stress Disorder Reaction Index, Aga Khan University Anxiety and Depression Scale (AKUADS), and the Positive and Negative Syndrome Scale (PANSS). Qualitative measures of impact included participatory action research, implementation research, case study, and other qualitative approaches with an aim to explore broader systems components.

**Intervention effects across the building blocks**

Of the 30 studies, 25 (83%) included mention of the six WHO health system building blocks other than service delivery and health workforce (Table 6). All 30 studies included some aspect of the seventh additional building block (communities and people) through community engagement and/or efforts to understand community needs in order to best integrate lay providers.

Sixteen studies of the 25 (80%), considered the role of information and technology. This building block was often mentioned in terms of use of technology for screening of mental illness (Hung et al. 2014; Padilla et al. 2015), use of mobile technology for supervision of lay providers (Tomlinson et al. 2011; Magidson et al. 2015; Agyapong et al. 2016), and need for improved data management tools to ensure adequate follow-up patients at-risk of poor mental health (Agyapong et al. 2015b; Abas et al. 2016). Facilitators identified to support this need were the use of step sheets for enhanced fidelity to interventions and training on documentation of patient visits on mobile phones (Bolton et al. 2014; Rotheram-Borus et al. 2015; Murray et al. 2015b).

Eleven studies (55%) considered the implications of the medicines and medical devices. The discrepancies between training and service delivery in prescribing practices were a challenge in task shifting for mental health (Agyapong et al. 2016). That is, lay providers, not trained in prescription of psychotropic medicines, found themselves prescribing them due to community needs (Agyapong et al. 2015a). Shortage of medicines and the resulting limitations placed on lay providers were impediments in achieving improved health outcomes and demoralized providers who were unable to provide adequate care (Petersen et al. 2011;
| Author | Building blocks | Barriers across building blocks | Facilitators across building blocks | Systems thinking characteristics | Intersectoral collaboration |
|--------|----------------|-------------------------------|-----------------------------------|--------------------------------|--------------------------|
| Abas et al. (2016) | SD, HRH, IT, FS, C | Financial incentives for lay providers; payment mechanisms for patients. Data management tools need improvement Poor documentation | Links to income-generation projects for patients |  |  |
| Agyapong et al. (2015b) (I) | SD, HRH, IT, C |  |  |  |  |
| Agyapong et al. (2015a) (II) | SD, HRH, IT, MD, FS, LG, C | Lack of training in psychotropic medicine & inappropriate prescribing practice; demand-side financing | Involvement of key policy stakeholders increased understanding of ground level realities; support from mental health professionals; collaboration with traditional healers Identification of stakeholder perspectives |  |  |
| Agyapong et al. (2016) | SD, HRH, IT, MD, FS, LG, C | Perceptions of quality; inappropriate prescribing practice; lack of financing to facilitate access by patients; disconnect with policy makers | Involvement of policy stakeholders; Mobile technology for supervision Identification of stakeholder perspectives |  |  |
| Ali et al. (2010) | SD, HRH, MD, C | Acceptability enhanced due to resistance of women to use of pharmacotherapy |  |  |  |
| Bolton et al. (2014) | SD, HRH, HIS, C | Step sheets used to ensure fidelity and follow-up | To better serve the psychosocial needs of the population, ‘the apprenticeship model included feedback loops encouraging local counsellors and supervisors to modify delivery of components to increase the fit with the culture and local setting, based on their ongoing experiences’ |  | The trial is a collaboration across NGOs: Burma Border Projects (an international NGO), and three local service organizations – Assistance Association for Political Prisoners–Burma (AAPP), Mae Tao Clinic (MTC), and Social Action for Women (SAW), funded by US Agency for International Development Victims of Torture Fund |
| Buttorff et al. (2012) | SD, HRH, FS, C | Determining cost to households of mental illness is difficult due to the variable ways households cope with illness | Scale-up found to be cost effective based on model proposed |  |  |

(Continued)
| Author              | Building blocks | Barriers across building blocks | Facilitators across building blocks                                                                 | Systems thinking characteristics                                                                 | Intersectoral collaboration                                                                 |
|--------------------|-----------------|--------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Chatterjee et al.  | SD, HRH, MD,    |                                | Caregivers enhanced adherence to medicines; social and economic recovery were identified as important contributors to mental health interventions; support provided for access to employment opportunities | Established ‘networks with community agencies to address social issues, to help with social inclusion, access to legal benefits, and employment opportunities’. |                                                                                             |
|                    | FS, C           |                                |                                                                                                  |                                                                                                  |                                                                                             |
| Hung et al. (2014) | SD, HRH, IT,    | Heavy workloads                 | Establishing networks with community agencies to address social issues, to help with social inclusion, access to legal benefits, and employment opportunities |                                                                                                  |                                                                                             |
| Larson-Stoa et al.| SD, HRH, IT,    | Gender differences in treatment response; unable to provide care to all (psychosis patients) due to financial limitations | Technology for screening                                                                        |                                                                                                  |                                                                                             |
| (2015)             | MD, FS, C       |                                |                                                                                                  |                                                                                                  |                                                                                             |
| Lorenzo et al. (2015) | SD, HRH, IT,       | Lack of horizontal coordination across different sectors involved in disability management | Referral management systems; financial advice to patients                                        | Identification of lack of coordination across sectors working on disability and associated feedback mechanism | Education, Social Development, Transport sectors involved; lack of coordination was a challenge |
| Magidson et al. (2015) | SD, HRH, IT, | Lack of infrastructure, overburdening workload, community preferences around who should work as lay providers, lack of recognition for taking on new roles, unclearly defined roles, lack of private spaces for mental health consultation, and confidentiality; social and educational factors posed challenges to acceptability (i.e. perceived inability to provide sufficient care); lack of transport to a health facility, inadequate compensation, and limited availability of specialists for training and supervision of lay providers; failure to prioritize psychotherapy and behavioural interventions alongside a bias toward medication |
| Mendenhall et al. (2014) | SD, HRH, IT,   |                                | Identification of stakeholder perspectives, systemic challenges, and sociocultural nuances     |                                                                                                  |                                                                                             |
| Authors and Year(s) | SD, HRH, FS, LG, C | Workload and retention; lack of funding (minimal sessions and only one post assessment follow-up) | Where high-risk cases were identified, the Child Protection Unit was informed, initiating an investigation for child abuse and neglect |
|---------------------|-------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Murray et al. (2014) | SD, HRH, IT, C    | Transportation, personnel problems, culture and climate, and buy-in                              | Apprenticeship model using step sheets and detailed information allowed the project to work |
| Neuner et al. (2008) | SD, HRH, FS, LG, C | Forced repatriation in settlement camps forced refugees into hiding and a resettlement programme caused loss to follow-up; basic package of health services did not include mental health | Barriers and facilitators identified during the implementation of the project were fed back into implementation design, adjusting for cultural and contextual needs (e.g., addition of alcohol use) |
| Nimgaonkar & Menon (2015) | SD, HRH, IT, MD, FS, LG, C | Medicines shortages; demand-side financial barriers | Decentralization of mental health services |
| Padilla et al. (2015) | SD, HRH, IT, FS, C | Perceptions of quality of care; prescribing practice and access to medicines | Technology for screening; provincial system’s universal coverage mechanism |
| Patel et al. (2010b) | SD, HRH, IT, MD, FS, LG, C | Prescribing practice and access to medicines | Telemedicine for supervision |
| Patel et al. (2011) | SD, HRH, MD, LG, C | Shortage of medicines | Person-centred approach in private facilities showed similar effects to the collaborative care approach |
| Petersen et al. (2011) | SD, HRH, IT, MD, FS, LG, C | Supporting socioeconomic wellbeing in patients (improve financial access); decentralization of mental health services | Links made across sectors and description of these interactions |

(Continued)
The bias towards medication as treatment also created challenges for prioritization of psychotherapy and behavioural interventions, affecting demand-side acceptability (Mendenhall et al. 2014).

Fifteen studies (70%) raised financing issues in task shifting for mental health with most referring to lack of funds as a limitation to scale-up, pointing to the need to prove cost-effectiveness as a means of ensuring investment by policy and decision makers (Agyapong et al. 2015a, 2016; Murray et al. 2015). Lack of financial incentives for lay providers and their supervisors was another challenge raised (Mendenhall et al. 2014; Abas et al. 2016). Some studies mentioned demand-side financing as a barrier to improved mental health delivery, citing the ability to pay for basic mental health services from the patient’s perspective (Neuner et al. 2008; Nimgaonkar & Menon, 2015; Abas et al. 2016). Ensuring that referrals were made to services covered by social protection mechanisms, was raised as an important element of providing sustainable and effective mental health service delivery by lay providers (Lorenzo et al. 2015; Padilla et al. 2015). Supporting patients through advice for socioeconomic well-being and links to income-generating projects was a means through which lay providers tried to address demand-side financial barriers (Baker-Henningham et al. 2005; Petersen et al. 2011; Lorenzo et al. 2015).

Finally, 10 studies (50%) mentioned leadership and governance issues with reference to task shifting for mental health. Programme-level supervision of lay providers, which was raised as a challenge across most of the studies included, was not captured as an overarching leadership and governance issue in this review as it is not sufficiently addressing system-level leadership and governance (Schneider & Lehmann, 2016). Perception surveys in Ghana directly involved policy directors, which provided an improved understanding of the gap between perceptions of lay provider programmes by policy directors and realities in the field (Agyapong et al. 2015a, b, 2016). Other studies referenced the need for policy support to integrate mental health services by lay providers into existing practice, citing governance structures as facilitators in scale-up and integration of mental health services through decentralization of these services (Petersen et al. 2011; Nimgaonkar & Menon, 2015). Leadership and governance structures were also barriers to integration. In larger, multi-country studies, lack of clarity in lay provider roles and confidentiality issues undermined integration of programmes from a supply-side perspective (Mendenhall et al. 2014). Community-level acceptability of programmes and perceptions on who can be a lay provider were cited as demand-side challenges that need mitigation through improved
transparency, accountability, and leadership that listens to the needs of the population, such as the need for transportation (Mendenhall et al. 2014). One study highlighted the siloed effect of multiple vertical programmes addressing disability across different sectors with no oversight or horizontal coordination (Lorenzo et al. 2015). In programmes targeted at vulnerable populations, such as refugees and orphans, continuity was a challenge as these populations are mobile. Leadership and governance issues beyond the health sector played a heavy role in the ability of lay providers to provide necessary mental health services; therefore, collaboration with other officials was raised as being important to the intervention (Neuner et al. 2008; Murray et al. 2015).

The use of systems thinking tools in evaluation of interventions

System dynamics theory or modelling tools were not directly used in any of the included studies; however, six studies took a more comprehensive approach in capturing system implications of the intervention being studied. An important element of systems thinking is understanding roles, characteristics, and interactions of the players involved. The perceptions surveys conducted in Ghana, the phenomenological approach across South Africa, Botswana and Malawi, the multi-country stakeholder perspective mapping, and the cross-country comparison of South Africa and Uganda through interviews and focus groups captured such perspectives and allowed for improved understanding of gaps to ensure successful scale-up and integration into the health system (Petersen et al. 2011; Mendenhall et al. 2014; Agyapong et al. 2015a, 2016; Lorenzo et al. 2015). These studies demonstrated the range of actors necessary for successful integration and showed that actors may have different interpretations of challenges, and different strengths in mitigating these challenges. Systems thinking also should allow for a non-linear process of change, whereby study findings are fed back into the design of the intervention; implementation research methods facilitate this, making adjustments for context and cultural needs (Mendenhall et al. 2014; Murray et al. 2014; Nimgaonkar & Menon, 2015).

In community mental health, robust referral pathways are an important piece of integration and working across stakeholders is necessary to ensure appropriate follow-up and service delivery for patients, not just within the health system, but also across other social sectors (Petersen et al. 2011; Lorenzo et al. 2015). Intersectoral components of included studies were captured in this review where available. Intersectoral collaboration here is based on the WHO concept of intersectoral action for health, defined as ‘a recognised relationship between part or parts of the health sector with parts of another sector which has been formed to take action on an issue to achieve health outcomes (or intermediate health outcomes) in a way that is more effective, efficient or sustainable than could be achieved by the health sector acting alone’ (WHO, 1997). Eight studies touched on efforts made beyond the health sector. These interventions focused on the education sector, where peer group support for AIDS counselling (Kumakech et al. 2009) or support for disability management (Lorenzo et al. 2015) would take place; across non-governmental organizations for vulnerable populations (Bolton et al. 2014); and with the criminal and social services sectors (Murray et al. 2015). In addressing disability challenges, social development and transport sectors were involved to make the lived environment more supportive of those living with both physical and mental disabilities (Lorenzo et al. 2015). Collaboration with the judicial system was also important in cases where abuse and neglect were part of the diagnosis (Murray et al. 2015).

Several studies raised social determinants of mental health, such as socioeconomic status, employment, lack of education, and violence as risk factors that needed to be addressed in order to enhance the positive effect of task shifting for mental health (Petersen et al. 2011; Mendenhall et al. 2014; Thurman et al. 2014; Lorenzo et al. 2015; Nimgaonkar & Menon, 2015; Wright & Chiwandira, 2016). One study highlighted health promotion activities through working with community resources, such as schools and churches, as an enabling factor (Wright & Chiwandira, 2016). Another mentioned the lack of such collaboration with other sectors as a barrier in seeing improved treatment outcomes (Thurman et al. 2014). Four studies had formal arrangements for embedding intersectoral practice in the task shifting (Petersen et al. 2011; Lorenzo et al. 2015). The intersectoral fora created to support these programmes strengthened their ability to integrate into existing systems and provided a wider range of community referral pathways for lay providers to use in linking their patients to the resources necessary for thriving, thereby indirectly enhancing mental health (Petersen et al. 2011; Chatterjee et al. 2014; Lorenzo et al. 2015). One such example is the referral of patients to income-generating programmes within the agricultural sector (Petersen et al. 2011).

Discussion

Despite the global call to action to improve scale-up and integration of lay provider programmes, the
Barriers and facilitators of scaling up mental health care by the building blocks

Barriers to scaling up mental health services identified across studies included: stigma around mental health in the community (Ali et al. 2010; Nimgaonkar & Menon, 2015; Padilla et al. 2015); poor documentation and loss of follow-up due to lack of robust data management and patient management tools (Agyapong et al. 2015b); lack of access to psychotropic medicines and/or lack of sufficient training for rational prescribing practice (Patel et al. 2011; Agyapong et al. 2015a; Nimgaonkar & Menon, 2015); geographic and financial demand-side barriers to access of mental health services (Baker-Henningham et al. 2005; Petersen et al. 2011; Mendenhall et al. 2014; Agyapong et al. 2015a); poor collaboration with spiritual and traditional healers (Agyapong et al. 2015a); disconnect between providers and decision makers (Agyapong et al. 2015a, 2016; Rotheram-Borus et al. 2015); existing heavy workload of lay providers (Petersen et al. 2011; Hung et al. 2014); gender differences in responding to treatment (Larson-Stoa et al. 2015); and lack of access to community resources to support social determinants of mental health (Tomlinson et al. 2011; Thurman et al. 2014; Rotheram-Borus et al. 2015).

Facilitators to scaling up mental health services identified across studies included: suitability of lay providers due to their ability to relate to the community and their patients (Baker-Henningham et al. 2005; Padilla et al. 2015; Abas et al. 2016); support from specialized mental health professionals (Agyapong et al. 2015a, b); use of technology and telemedicine to support supervisory practice (Patel et al. 2011; Tomlinson et al. 2011; Magidson et al. 2015; Agyapong et al. 2016); integrated interventions that include life skill building for sustainable livelihood practice, social interaction, and self-care (Petersen et al. 2011; Chatterjee et al. 2014); and integration into existing networks with robust service delivery models that support lay providers (Petersen et al. 2011; Nimgaonkar & Menon, 2015).

While information and technology tools appear to be facilitators for optimizing service delivery by lay providers, care must be taken in the selection of technology solutions. It is critical to understand how providers use technology as a part of the system. Some tools require the interpretation and training of health professionals to be appropriately and efficiently used, suggesting that not all technologies are readily transferable across health workforce cadres (Jotheeswaran et al. 2015; Robbins et al. 2015). Inefficiencies in the system can also be found in poor access to medicines (WHO, 2009). Financial and procurement barriers impede access to essential psychotropic medicines, impeding the delivery of appropriate mental health care to those who require pharmacotherapy (Agyapong et al. 2015a; Nimgaonkar & Menon, 2015). Scaling up mental health treatment by lay providers without addressing access to medicines in parallel will prove unsuccessful by undermining the quality and impact of additional service provision (WHO, 2009).

The barriers and facilitators outlined here showcase the complexity involved in task shifting for mental health and the need for a broader systems approach to mitigating barriers and leveraging facilitators. By being community-based and having a deep understanding of community needs and assets, lay providers have an enhanced ability to identify social determinants of mental health within a given context (Richters et al. 2013; Padilla et al. 2015). This rich knowledge, combined with appropriate training, puts them in the optimal position to refer patients to relevant social services (Paudel et al. 2014). Mental health is often a comorbidity in chronic disease management; training programmes should also prepare lay providers with the knowledge and skills necessary to
understand such linkages and to refer appropriately (Rotheram-Borus et al. 2015).

Establishing networks and intersectoral linkages is not easy. Despite policy support, implementation and scale-up of integrated approaches to strengthening community mental health remains a challenge (Hanlon et al. 2014). Even where formal mechanisms are in place for intersectoral collaboration (i.e. where formal engagement of health, education and development sectors are embedded in programme design), participation was erratic and uncertain without senior officials present (Petersen et al. 2011). Existing models and formal arrangements of intersectoral collaboration require additional incentives and governmental support. In this way, partnerships move beyond platitudes and truly work as collaborative fora that support lay providers in assessing patient needs and selecting appropriate referral pathways.

Implications for future research

Mental health is rarely an isolated problem. It sometimes stems from physical, environmental, or sociocultural challenges and creates positive feedback loops that become difficult to break (Tomlinson et al. 2011; Thurman et al. 2014). Taking a systems thinking approach to unpacking task-shifting interventions for mental health will unveil extant opportunities and threats in the current system. A system-level understanding of interventions will allow for improved integration and effective engagement of important actors overlooked in the traditional model of implementation and evaluation. Such actors include caregivers, nongovernmental entities that support social determinants of mental health, employers, spiritual leaders, and other social sectors (e.g., education, agriculture, transport, social development, etc.) (Schneider & Lehmann, 2016). Representing the system overall and opportunities for improvement in the implementation and evaluation of such programmes can advocate for further investment in community mental health systems strengthening.

With appropriate evidence describing the roles and contributions of diverse sectors to mental health outcomes, there is potential to facilitate strategic intersectoral investment for optimal health impact as well as cost-effectiveness. Stigma, for instance, is an often-cited barrier in mental health seeking behaviours and even in provision of mental health care (van Ginneken et al. 2013; Nimgaonkar & Menon, 2015; Iheanacho et al. 2016; Weinmann & Koesters, 2016). A study of church-based lay providers showed that higher education was correlated with improved biopsychosocial perspectives on mental health and fewer displays of stigma-based behaviour (Iheanacho et al. 2016). Overcoming stigma is therefore not necessarily limited to the role of the health sector; the education sector can play an important part in addressing stigma by talking about mental health and raising awareness.

Due to the nature of the search strategy, this review highlighted interventions that were conducted primarily in the health sector. Few included studies employed task-shifting strategies across other sectors to enhance mental health promotion. More examples of such collaboration exist, especially in education and social services. Therefore, it would be worth conducting a more targeted review of the evidence on interventions happening in other sectors that have impacts on mental health. Skill-mixing interventions also warrant more emphasis as they highlight the need for a range of skills beyond the health sector to address mental health challenges. Comparing the effectiveness of mental health-related interventions housed in the health sector v. those in others would be valuable in identifying cost-effective opportunities for intersectoral collaboration and cohesive strategies for mental health.

Limitations of this review may include the wide variety of mental health interventions, populations studied, and outcome measures included, making it potentially difficult or inappropriate to apply this review’s broader conclusions to unique mental health conditions. While the majority of studies did not explicitly use a systems thinking approach, some studies indicated implicit consideration of systems thinking characteristics. It is possible that studies neglecting to mention system-wide effects in final manuscripts did in fact acknowledge these effects in the design and implementation of interventions to some degree, but this data was subsequently not available for this review.

Conclusions

Task shifting for mental health has been demonstrated as an acceptable and effective approach to addressing the mental health gap in LMICs. This review shows the complexity of task-shifting interventions by exploring interactions of intervention elements and actors across the six WHO building blocks. There is a lack of systematic approaches to exploring this complexity in the evaluation of task-shifting interventions. Systems thinking tools should support evidence-informed decision making for a more complete understanding of community-based systems strengthening interventions for mental health.

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Declaration of Interest

Authors have no conflicts of interest to declare.

Ethical Standards

This review did not involve human subjects and was therefore not subject to ethical review.

References

Abas M, Bowers T, Manda E, Cooper S, Machando D, Verhey R, Lamech N, Araya R, Chibanda D (2016). ‘Opening up the mind’: problem-solving therapy delivered by female lay health workers to improve access to evidence-based care for depression and other common mental disorders through the Friendship Bench Project in Zimbabwe. International Journal of Mental Health Systems 10, 39.

Adam T, Hsu J, De Savigny D, Lavis JN, Rottingen JA, Bennett S (2012). Evaluating health systems strengthening interventions in low-income and middle-income countries: are we asking the right questions? Health Policy and Planning 27(Suppl 4), iv9–iv19.

Agyapong VI, Osei A, Farren CK, Mcauliffe E (2015a). Task shifting – Ghana’s community mental health workers’ experiences and perceptions of their roles and scope of practice. Global Health Action 8, 28955.

Agyapong VI, Osei A, Farren CK, Mcauliffe E (2015b). Task shifting of mental health care services in Ghana: ease of referral, perception and concerns of stakeholders about quality of care. International Journal for Quality in Health Care 27, 377–383.

Agyapong VI, Osei A, McLoughlin DM, Mcauliffe E (2016). Task shifting-perception of stake holders about adequacy of training and supervision for community mental health workers in Ghana. Health Policy and Planning 31, 645–655.

AHPSR (2009). Systems Thinking for Health Systems Strengthening. World Health Organization: Geneva.

Ali BS, Rahbar MH, Naeem S, Gul A, Mubeen S, Iqbal A (2003). The effectiveness of counseling on anxiety and depression by minimally trained counselors: a randomized controlled trial. American Journal of Psychotherapy 57, 324–336.

Ali NS, Ali BS, Azam IS, Khuwaja AK (2010). Effectiveness of counseling for anxiety and depression in mothers of children ages 0–30 months by community workers in Karachi, Pakistan: a quasi experimental study. BMC Psychiatry 10, 57.

Atif N, Lovell K, Rahman A (2015). Maternal mental health: the missing ‘m’ in the global maternal and child health agenda. Seminars in Perinatology 39, 345–352.

Baker-Henningham H, Powell C, Walker S, Grantham-Mcgregor S (2005). The effect of early stimulation on maternal depression: a cluster randomised controlled trial. Archives of Disease in Childhood 90 (http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/147/CN-00530147/frame.html).

Bolton P, Lee C, Haroz EE, Murray L, Dorsey S, Robinson C, Ugueto AM, Bass J (2014). A transdiagnostic community-based mental health treatment for comorbid disorders: development and outcomes of a randomized controlled trial among Burmese refugees in Thailand. PLoS Medicine 11, e1001757.

Buttorff C, Hock RS, Weiss HA, Naik S, Araya R, Kirkwood BR, Chisholm D, Patel V (2012). Economic evaluation of a task-shifting intervention for common mental disorders in India. Bulletin of the World Health Organization 90 (http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/798/CN-00852798/frame.html).

CASP (2016). Critical Appraisal Skills Program: Making Sense of Evidence. UK (http://www.Casp-Uk.Net/Casp-Tools-Checklists).

Chatterjee S, Naik S, John S, Dabholkar H, Balaji M, Koschorke M, Varghese M, Thara R, Weiss HA, Williams P, Mccrone P, Patel V, Thornicroft G (2014). Effectiveness of a community-based intervention for people with schizophrenia and their caregivers in India (COPSI): a randomised controlled trial. Lancet (London, England) 383 (http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/973/CN-00988973/frame.html).

Chibanda D, Cowan FM, Healy JL, Abas M, Lund C (2015). Psychological interventions for common mental disorders for people living with HIV in low- and middle-income countries: systematic review. Tropical Medicine & International Health 20, 830–839.

Chowdhary N, Sikander S, Atif N, Singh N, Ahmad I, Fuhr DC, Rahman A, Patel V (2014). The content and delivery of psychological interventions for perinatal depression by non-specialist health workers in low and middle income countries: a systematic review. Best Practice & Research: Clinical Obstetrics & Gynaecology 28, 113–133.

Eaton J, McCay I, Semrau M, Chatterjee S, Baingana F, Araya R, Ntulo C, Thornicroft G, Saxena S (2011). Scale up of services for mental health in low-income and middle-income countries. Lancet 378, 1592–1603.

Fulton BD, Scheffler RM, Sparks PE, Auh EY, Vujicic M, Soucat A (2011). Health workforce skill mix and task shifting in low income countries: a review of recent evidence. Human Resources for Health 9, 1.

GHWA (2007). Systems Support for Task-Shifting to Community Health Workers. Technical Briefing, Global Health Workforce Alliance: Geneva.

GHWA (2013). Joint Commitment to Harmonized Partners Action for Community Health Workers and Frontline Health Workers: Moving from Fragmentation to Synergy Toward Universal Health Coverage. Third Global Forum on human resources for Health, Global Health Workforce Alliance: Brazil.

Hanlon C, Luitel NP, Kathree T, Murhar V, Shrivasta S, Medhin G, Ssebunya J, Fekadu A, Shidhaye R, Petersen I, Jordans M (2014). Challenges and opportunities for implementing integrated mental health care: a district level situation analysis from five low-and middle-income countries. PLoS ONE 9, 1–7.

Hung KJ, Tomlinson M, Le Roux IM, Dewing S, Chopra M, Tsai AC (2014). Community-based prenatal screening for postpartum depression in a South African township. International Journal of Gynaecology and Obstetrics 126, 74–77.
Iheanacho T, Kapadia D, Ezeanolue CO, Osuji AA, Ogidi AG, Ike A, Patel D, Stefanovics E, Rosenheck R, Obiefun M, Ezeanolue EE (2016). Attitudes and beliefs about mental illness among church-based lay health workers: experience from a prevention of mother-to-child HIV transmission trial in Nigeria. *International Journal of Culture And Mental Health* 9, 1–13.

Joshi R, Alim M, Kengne AP, Jonathan A, Poudyal B, Kumakech E, Cantor-Graae E, Maling S, Bajunirwe F, Johan S, Maulik PK, Peiris D, Arsenjevic vs, Artaman A, Asghar RJ, Assadi R, Atkins LS, Avila MA, Awuah B, Bachman VF, Badawi A, Bahit MC, Balakrishnan K, Banerjee A, Barker-Collo SL, Barquera S, Barregard L, Barrero LH, Basu A, Basu S, Basualdam MO, Beardsley J, Bedi N, Beghi E, Bekele T, Bell ML, Benjet C, Bennett DA, Bensonor IM, Benzian H, Bembake E, Bentozzi-Villa A, Beyene TJ, Bhala N, Bhalla A, Bhutta ZA, Bienhoff K, Bikbov B, Birdyukov S, Blore JD, Blosser CD, Blyth FM, Bohensky MA, Bolliger IW, Bora Basara B, Bornstein NM, Bose D, Boufous S, Bourne RR, Boyers LN, Brainin M, Brayne CE, Brazinova A, Breiborde NJ, Brenner H, Briggs AD, Brooks PM, Brown JC, Brugha TS, Buchbinder R, Buckle GC (2015a). Global, regional, and national disability-adjusted life years (DALYs) for 306 diseases and injuries and healthy life expectancy (HALE) for 188 countries, 1990–2013: quantifying the epidemiological transition. *Lancet* 386, 2145–2191.

Murray LK, Dorsey S, Hanoz E, Lee C, Ali, Asfarya MM, Haydary A, Weiss WM, Bolton P (2014). A common elements treatment approach for adult mental health problems in low- and middle-income countries. *Cognitive and Behavioral Practice* 21, 111–123.

Murray LK, Skavenski S, Kane JC, Mayeya J, Dorsey S, Cohen JA, Michalopoulos LT, Imasiku M, Bolton PA (2015b). Effectiveness of trauma-focused cognitive behavioral therapy among trauma-affected children in Lusaka, Zambia: a randomized clinical trial. *JAMA Pediatrics* 169, 761–769.

Murthy RS (2011). *Mental Health Services in Low- and Middle-Income Countries*. Oxford University Press: Oxford.

Neuner F, Onyut PL, Ertl V, Odendal M, Schauer E, Elbert T (2008). Treatment of posttraumatic stress disorder by trained lay counselors in an African refugee settlement: a randomized controlled trial. *Journal of Consulting and Clinical Psychology* 76, 686–694.

Niekert V (2008). Task shifting or power shedding? *South African Medical Journal* 98, 327.

Nimmoakar AU, Menon SD (2015). A task shifting mental health program for an impoverished rural Indian community. *Asian Journal of Psychiatry* 16, 41–47.

Olaniran A, Smith H, Unkels R, Bar-Zeev S, Van Den Broek N, Van Den Broek N (2017). Who is a community health worker? – a systematic review of definitions. *Global Health Action* 10, 1–13.

Padilla E, Molina J, Kamis D, Calvo M, Stratton L, Streilevich S, Aleman GG, Guerrero G, Bourdieu M, Conesa HA, Escobar JL, De Erasquin GA (2015). The efficacy of targeted health agents education to reduce the duration of untreated psychosis in a rural population. *Schizophrenia Research* 161, 184–187.

Patek V, Araya R, Chatterjee S, Chisholm D, Cohen A, De Silva M, Hosman C, Maguire HS, Rojas G, Van Ommeren M (2007). Treatment and prevention of mental disorders in low-income and middle-income countries. *Lancet* 370, 991–1005.
Patel V, Maj M, Flisher AJ, De Silva MJ, Koschorke M, Prince M (2010a). Reducing the treatment gap for mental disorders: a WPA survey. *World Psychiatry* 9, 169–176.

Patel V, Thornicroft G (2009). Packages of care for mental, neurological, and substance use disorders in low- and middle-income countries: PLoS medicine series. *PLoS Medicine* 6, e1000160.

Patel V, Weiss HA, Chowdhary N, Naik S, Pednekar S, Chatterjee S, Bhat B, Araya R, King M, Simon G, Verdeli H, Kirkwood BR (2011). Lay health worker led intervention for depressive and anxiety disorders in India: impact on clinical and disability outcomes over 12 months. *British Journal of Psychiatry* 199, 459–466.

Patel V, Weiss HA, Chowdhary N, Naik S, Pednekar S, Chatterjee S, Silva MJ, Bhat B, Araya R, King M, Simon G, Verdeli H, Kirkwood BR (2010b). Effectiveness of an intervention led by lay health counsellors for depressive and anxiety disorders in primary care in Goa, India (MANAS): a cluster randomised controlled trial. *Lancet* (London, England) 376 (http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/666/CN-000770666/frame.html).

Paudel S, Gilies N, Hahn S, Hexom B, Premkumar R, Arole S, Katz C (2014). Impact of mental health training on village health workers regarding clinical depression in rural India. *Community Mental Health Journal* 50, 480–486.

Peters DH (2014). The application of systems thinking in health: why use systems thinking? *Health Research Policy and Systems* 12, 51.

Petersen I, Ssebunnya J, Bhana A, Baillie K (2011). Lessons from case studies of integrating mental health into primary health care in South Africa and Uganda. *International Journal of Mental Health Systems* 5, 8.

Philips M, Zachariah R, Venis S (2008). Task shifting for antiretroviral treatment delivery in sub-Saharan Africa: not a panacea. *Lancet* 371, 682–684.

Pradeep J, Isaacs A, Shanbag D, Selvan S, Srinivasan K (2014). Enhanced care by community health workers in improving treatment adherence to antidepressant medication in rural women with major depression. *Indian Journal of Medical Research* 139, 236–245.

Rahman A, Fisher J, Bower P, Luchters S, Tran T, Yasamy MT, Saxena S, Waheed W (2013). Interventions for common perinatal mental disorders in women in low- and middle-income countries: a systematic review and meta-analysis. *Bulletin of the World Health Organization* 91, 593–601.

Rahman A, Malik A, Sikander S, Roberts C, Creed F (2008). Cognitive behaviour therapy-based intervention by community health workers for mothers with depression and their infants in rural Pakistan: a cluster-randomised controlled trial. *Lancet* (London, England) 372 (http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/058/CN-00651058/frame.html).

Richards A, Rutayisire T, Sleigh H (2013). Sexual transgression and social disconnection: healing through community-based sociotherapy in Rwanda. *Culture, Health & Sexuality* 15, 5581–5593.

Robbins RN, Mellins CA, Leu CS, Rowe J, Warne P, Abrams EJ, Witte S, Stein DJ, Remien RH (2015). Enhancing Lay Counselor Capacity to Improve Patient Outcomes with Multimedia Technology. *AIDS and Behavior* 19(Suppl 2) (http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/224/CN-01111224/frame.html).

Rotheram-Borus MJ, Tomlinson M, Le Roux I, Stein JA (2015). Alcohol use, partner violence, and depression: a cluster randomized controlled trial among urban South African mothers over 3 years. *American Journal of Preventive Medicine* 49, 715–725.

Schneider H, Lehmann U (2016). From community health worker to community health system: time to widen the horizon? *Health Systems and Reform* 2, 112–118.

Thurman TR, Kidman R, Taylor TM (2014). Does investment in home visitors lead to better psychological health for HIV-affected families? Results from a quasi-experimental evaluation in South Africa. *AIDS Care* 26, S2–S10.

Tomlinson M, Doherty T, Jackson D, Lawn JE, Ijumba P, Colvin M, Nkonki I, Daviaud E, Goga A, Sanders D, Lombard C, Persson L, Ndaba T, Snetro G, Chopra M (2011). An effectiveness study of an integrated, community-based package for maternal, newborn, child and HIV care in South Africa: study protocol for a randomized controlled trial. *Trials* 12 (http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/624/CN-00860624/frame.html).

van Ginneken N, Tharyan P, Lewin S, Rao Girish N, Meera SM, Pian J, Chandrashekar S, Patel V (2013). Non-specialist health worker interventions for the care of mental, neurological and substance-abuse disorders in low- and middle-income countries. *Cochrane Database of Systematic Reviews* (http://onlinelibrary.wiley.com/o/doi/10.1002/14651858.CD009149.pub2/abstract).

Wang PS, Aguilar-Gaxiola S, Alonso J, Angermeyer MC, Borges G, Bromet EJ, Bruffaerts R, De Girolamo G, De Graaf R, Gureje O, Haro JM, Karam EG, Kessler RC, Kovess V, Lane MC, Lee S, Levinson D, Ony O, Petukhova M, Posada-Villa J, Seedat S, Wells JE (2007). Use of mental health services for anxiety, mood, and substance disorders in 17 countries in the WHO world mental health surveys. *Lancet* 370, 841–850.

Weinmann S, Koesters M (2016). Mental health service provision in low and middle-income countries: recent developments. *Current Opinion in Psychiatry* 29, 270–275.

Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, Charlson FJ, Norman RE, Flaxman AD, Johns N, Burstein R, Murray CJ, Vos T (2013). Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. *Lancet* 382, 1575–1586.

WHO (1997). Intersectoral action for health: a cornerstone for health-for-all in the twenty-first century. In (ed. WHO), International Conference on Intersectoral Action for Health, Halifax, Canada. WHO.

WHO (2006). *World Health Report 2006: Working Together for Health*. World Health Organization: Geneva.

WHO (2007a). *Everybody’s Business: Strengthening Health Systems to Improve Health Outcomes*. World Health Organization: Geneva.

WHO (2007b). Joint WHO/OGAC Technical Consultation on Task Shifting: Key Elements of a Regulatory Framework in Support of In-country Implementation of Task Shifting. World Health Organization: Geneva.
WHO (2008). mhGAP Mental Health Gap Action Programme: Scaling Up Care for Mental, Neurological, and Substance Use Disorders. World Health Organization: Geneva.

WHO (2009). Improving Health Systems and Services for Mental Health. World Health Organization: Geneva.

WHO (2010). Monitoring the Building Blocks of the Health System. World Health Organization: Geneva.

WONCA (2008). Integrating mental health into primary care: a global perspective. In (ed. WHO), Singapore World Health Organization; World Organization of Family Doctors: Geneva, Switzerland.

Wright J, Chiwandira C (2016). Building capacity for community mental health care in rural Malawi: findings from a district-wide task-sharing intervention with village-based health workers. International Journal of Social Psychiatry 62, 589–596.

Yaya Bocoum F, Kounanda S, Kouyate B, Hounton S, Adam T (2013). Exploring the effects of task shifting for HIV through a systems thinking lens: the case of Burkina Faso. BMC Public Health 13, 997.

Zachariah R, Ford N, Philips M, Lynch S, Massquoi M, Janssens V, Harries AD (2009). Task shifting in HIV/AIDS: opportunities, challenges and proposed actions for sub-Saharan Africa. Transactions of the Royal Society of Tropical Medicine and Hygiene 103, 549–558.

Annexure 1. Search Strategy

CINAHL-Ebsco

**Concept 1. Mental Health**

(MH “Mental Health Personnel”) OR (MH “Mental Health”) OR (MH “Mental Health Services”) OR (MH “Community Mental Health Services”) OR (MH “Community Mental Health Nursing”) OR (MH “Mental Health Organizations”) OR (MH “Developmental Disabilities”) OR (MH “Intellectual Disability”) OR (MH “Health Services for Persons with Disabilities”) OR (MH “Mental Disorders”) OR (MH “Support, Psychosocial”) OR (MH “Depression”) OR (MH “Bipolar Disorder”) OR (MH “Dementia”) OR (MH “Schizophrenia”) OR MH “substance use disorders” OR TI “mental health” or TI “mental healthcare” or TI “mental illness” or TI “mental disorder” or TI “mental disorders” or TI “disabled” or TI “disability” or TI “disabilities” or TI “neurologic disorder” or TI “depression” or TI “depressive” or TI “depressed” or TI “PTSD” or TI “psychosis” or TI “psychoses” or TI “epilepsy” or TI “seizures” or TI “Developmental Disabilities” or TI “Learning Disorders” or TI “autism” or TI “dementia” or TI “substance abuse” or TI “overuse” or TI “substance dependence” or TI “drug dependency” or TI “harmful use” or TI “hazardous use” or TI “suicide” or TI “self-harm” or TI “mental retardation” or TI “neurotic” or TI “alcoholism” or TI “alcoholic” or TI “psychotropic” or TI “anxiolytics” or TI “depressant” or TI “epileptic” or TI “mood stabilizers” or TI “psychosocial support” or TI “psychology” or TI “psychological” or TI “psychotherapy” or TI “rehabilitation” or TI “stigma” or TI “support group” or TI “cognitive therapy” OR TI “reality therapy” OR TI “behavior therapy” or TI “behaviour therapy” or TI “self-help group” OR AB “mental health” or AB “mental healthcare” or AB “mental illness” or AB “mental disorder” or AB “mental disorders” or AB “disabled” or AB “disability” or AB “disabilities” or AB “neurologic disorder” or AB “depression” or AB “depressive” or AB “depressed” or AB “PTSD” or AB “psychosis” or AB “psychoses” or AB “psychotic” or AB “Schizophrenia” or AB “bipolar” or AB “epilepsy” or AB “seizures” or AB “Developmental Disabilities” or AB “Learning Disorders” or AB “autism” or AB “psychosocial support” or AB “alcoholism” or AB “alcoholic” or AB “anxiolytics” or AB “depressant” or AB “epileptic” or AB “mood stabilizers” or AB “psychotherapy” or AB “cognitive therapy” or AB “reality therapy” OR AB “behavior therapy” or AB “behaviour therapy” or AB “self-help group”

Concept 2. Community health workers

(MH “Community Health Workers”) OR (MH “Rural Health Personnel”) OR MH “Allied Health Personnel” (MH “Community Health Services”) OR TI “health extension worker” or TI “health extension workers” or TI “community health worker” or TI “community health workers” or TI “community health aide” or TI “home health aide” or TI “community health representative” or TI “community health representatives” or TI “community networks” or TI “peer group” or TI “lay volunteer” or TI “lay worker” or TI “lay health worker” or TI “lay health workers” or TI “lay health advisor” or TI “lay health advisors” or TI “barefoot doctor” or TI “barefoot doctors” or TI “peer to peer” or TI “community based practitioner” or TI “community based practitioners” or TI “Accredited social health activist” or TI “Accredited social health activists” or TI “village health worker” or TI “village health workers” or TI “village health guide” or TI “village health guides” or TI “village health support guide” or TI “village health support guides” or TI “health auxiliary worker” or TI “health auxiliary workers” or TI “front-line health worker” or TI “front-line health workers” or TI “Shasthyo Sevikas” or TI “Community Outreach
Worker” or TI “Community Outreach Workers” or TI “Peer Counsellor” or TI “Peer Counsellors” or TI “Peer Counsellor” or TI “Peer Counsellors” or TI Promotora or TI “peer educator” or TI “peer educators” or TI “non-physician healthcare worker” or TI “non-physician healthcare workers” or TI “task-sharing” or TI “task shifting” or TI “task-sharing” or AB “health extension worker” or AB “health extension workers” or AB “community health worker” or AB “community health workers” or AB “community health aide” or AB “home health aide” or AB “community health representative” or AB “community health representatives” or AB “community networks” or AB “peer group” or AB “lay volunteer” or AB “lay worker” or AB “lay health worker” or AB “lay health workers” or AB “lay health advisor” or AB “lay health advisors” or AB “barefoot doctor” or AB “barefoot doctors” or AB “peer to peer” or AB “community based practitioner” or AB “community based practitioners” or AB “community-based practitioner” or AB “community-based practitioners” or AB “Accredited social health activist” or AB “Accredited social health activists” or AB “village health worker” or AB “village health workers” or AB “village health guide” or AB “village health guides” or AB “village health support guide” or AB “village health support guides” or AB “health auxiliary worker” or AB “health auxiliary workers” or AB “front-line health worker” or AB “front-line health workers” or AB “Shasthyo Sevikas” or AB “Community Outreach Worker” or AB “Community Outreach Workers” or AB “Peer Counsellor” or AB “Peer Counsellors” or AB “Peer Counsellor” or AB “Peer Counsellors” or AB Promotora or AB “peer educator” or AB “peer educators” or AB “non-physician healthcare worker” or AB “non-physician healthcare workers” or AB “task-sharing” or AB “task shifting” or AB “task-sharing” or
task-sharing”

**Concept 3. LMICs**

(MH “Developing Countries”) OR (MH “Africa, Central”) OR (MH “Africa, Northern”) OR (MH “Africa, Western”) OR (MH “Africa, Eastern”) OR (MH “Africa, Southern”) OR Africa or Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelorussian or Byelorus or Belarus or Belarusian or Belarusia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Herzegovina or Botswana or Brazil or Bulgaria or “Burkina Faso” or “Burkina Faso” or “Upper Volta” or Burundi or Urundi or Cambodia or “Khmer Republic” or Kampuchea or Cameroon or Cameroons or Cameroon or Camerons or “Cape Verde” or “Central African Republic” or Chad or Chile or China or Colombia or Comoros or “Comoros Islands” or Comores or Mayotte or Congo or Zaire or “Costa Rica” or “Cote d’Ivoire” or “Ivory Coast” or Croatia or Cuba or Cyprus or Czechoslovakia or “Czech Republic” or Slovakia or “Slovak Republic” or Djibouti or “French Somaliland” or Dominica or “Dominican Republic” or “East Timor” or “East Timur” or “Timor Leste” or Ecuador or Egypt or “United Arab Republic” or “El Salvador” or Eritrea or Estonia or Ethiopia or Fiji or Gabon or “Gabonese Republic” or Gambia or Gaza or “Georgia Republic” or “Georgian Republic” or Ghana or “Gold Coast” or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz or Kirghiz or Kirgizstan or “Lao PDR” or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy or Malaysia or Malay or Malay or Sabah or Sarawak or Malawi or Somaliland or Mali or Malta or “Marshall Islands” or Mauritania or Mauritius or “Agalega Islands” or Mexico or Micronesia or “Middle East” or Moldova or Moldovia or Moldovan or Mongolia or Montenegro or Morocco or Ilini or Mozambique or Myanmar or Myanmar or Burma or Namibia or Nepal or “Netherlands Antilles” or “New Caledonia” or Nicaragua or Niger or Nigeria or “Mariana Islands” or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philippines or Philippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or “Saint Kitts” or “St Kitts” or Nevis or “Saint Lucia” or “St Lucia” or “Saint Vincent” or “St Vincent” or Grenadines or Samoa or “Samoan Islands” or “Navigator Island” or “Navigator Islands” or “Sao Tome” or “Saudia Arabia” or Senegal or Serbia or Montenegro or Seychelles or “Sierra Leone” or Slovenia or “Sri Lanka” or Ceylon or “Solomon Islands” or Somalia or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhik or Tanzania or Thailand or Togo or Togolese or Tonga or Trinidad or Tobago or Tunisia or Turkey or

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global mental health
Turkmenistan OR Turkmen OR Uganda OR Ukraine OR Uruguay OR USSR OR “Soviet Union” OR “Union of Soviet Socialist Republics” OR Uzbekistan OR Uzbek OR Vanuatu OR “New Hebrides” OR Venezuela OR Vietnam OR “Viet Nam” OR “West Bank” OR Yemen OR Yugoslavia OR Zamb OR Zimbabwe OR Rhodesia OR TI “low- and middle-income” OR TI “low income” OR TI “low resource” OR AB “low resource” OR AB “low income” OR AB “low- and middle-income”

Cochrane Library

**Concept 1. Mental Health**

[mh “Depression”] OR [mh “Bipolar disorder”] OR [mh “Depressive disorder”] OR [mh “mental health”] OR [mh “community mental health services”] OR [mh “mental health services”] OR [mh “psychiatric rehabilitation”] OR [mh “psychiatric nursing”] OR [mh “mental disorders”] OR [mh “dementia”] OR [mh “schizophrenia”] OR [mh “developmental disabilities”] OR [mental health]:ti,ab,kw OR [mental healthcare]:ti,ab,kw OR [“mental illness”]:ti,ab,kw OR [“mental disorder”]:ti,ab,kw OR [mental disorders]:ti,ab,kw OR [“disability”]:ti,ab,kw OR [“disabilities”]:ti,ab,kw OR [“neurologic disorder”]:ti,ab,kw OR [“depression”]:ti,ab,kw OR [“depressive”]:ti,ab,kw OR [“PTSD”]:ti,ab,kw OR [“psychosis”]:ti,ab,kw OR [“psychoses”]:ti,ab,kw OR [“schizophrenia”]:ti,ab,kw OR [“bipolar”]:ti,ab,kw OR [“epilepsy”]:ti,ab,kw OR [“seizures”]:ti,ab,kw OR [“autism”]:ti,ab,kw OR [“substance abuse”]:ti,ab,kw OR [“substance abuse”]:ti,ab,kw OR [“drug abuse”]:ti,ab,kw OR [“overuse”]:ti,ab,kw OR [“substance dependence”]:ti,ab,kw OR [“drug dependence”]:ti,ab,kw OR [“harmful use”]:ti,ab,kw OR [“hazardous use”]:ti,ab,kw OR [“suicide”]:ti,ab,kw OR [“self-harm”]:ti,ab,kw OR [“mental retardation”]:ti,ab,kw OR [“neurotic”]:ti,ab,kw OR [“psychotropic”]:ti,ab,kw OR [“anxiolytics”]:ti,ab,kw OR [“depressant”]:ti,ab,kw OR [“epileptic”]:ti,ab,kw OR [“mood stabilizers”]:ti,ab,kw OR [“psychosocial support”]:ti,ab,kw OR [“psychology”]:ti,ab,kw OR [“psychological”]:ti,ab,kw OR [“psychotherapy”]:ti,ab,kw OR [“rehabilitation”]:ti,ab,kw OR [“stigma”]:ti,ab,kw OR [“support group”]:ti,ab,kw OR [“cognitive therapy”]:ti,ab,kw OR [“reality therapy”]:ti,ab,kw OR [“behavor therapy”]:ti,ab,kw OR [“behaviour therapy”]:ti,ab,kw OR [“self-help group”]:ti,ab,kw OR [“alcoholism”]:ti,ab,kw OR [“alcoholic”]:ti,ab,kw

**Concept 2. Community health workers**

[“community health workers”] OR [“allied health personnel”] OR [“health extension worker”]:ti,ab,kw OR [“health extension workers”]:ti,ab,kw OR [“community health worker”]:ti,ab,kw OR [“community health workers”]:ti,ab,kw OR [“community health aide”]:ti,ab,kw OR [“home health aide”]:ti,ab,kw OR [“community health representative”]:ti,ab,kw OR [“community health representatives”]:ti,ab,kw OR [“community networks”]:ti,ab,kw OR [“peer group”]:ti,ab,kw OR [“lay volunteer”]:ti,ab,kw OR [“lay worker”]:ti,ab,kw OR [“lay health worker”]:ti,ab,kw OR [“lay health workers”]:ti,ab,kw OR [“lay health advisor”]:ti,ab,kw OR [“lay health advisors”]:ti,ab,kw OR [“barefoot doctor”]:ti,ab,kw OR [“barefoot doctors”]:ti,ab,kw OR [“peer to peer”]:ti,ab,kw OR [“community based practitioner”]:ti,ab,kw OR [“community based practitioners”]:ti,ab,kw OR [“community based practitioner”]:ti,ab,kw OR [“community-based practitioners”]:ti,ab,kw OR [“community-based practitioners”]:ti,ab,kw OR [“community-based practitioners”]:ti,ab,kw OR [“community-based practitioners”]:ti,ab,kw OR [“community-based practitioners”]:ti,ab,kw OR [“community-based practitioners”]:ti,ab,kw OR [“Community Outreach Worker”]:ti,ab,kw OR [“Community Outreach Workers”]:ti,ab,kw OR [“Peer counsellor”]:ti,ab,kw OR [“Peer counsellors”]:ti,ab,kw OR [“Peer counselor”]:ti,ab,kw OR [“Peer counselors”]:ti,ab,kw OR [“Peer Counsellour”]:ti,ab,kw OR [“Peer Counsellours”]:ti,ab,kw OR [“Promotorat”]:ti,ab,kw OR [“peer educator”]:ti,ab,kw OR [“peer educators”]:ti,ab,kw OR [“non-physician healthcare worker”]:ti,ab,kw OR [“non-physician healthcare workers”]:ti,ab,kw OR [“task-shifting”]:ti,ab,kw OR [“task shifting”]:ti,ab,kw OR [“task-sharing”]:ti,ab,kw

**Concept 3. LMICs**

[“Developing Countries”] OR [“Africa, Central”] OR [“Africa, Northern”] OR [“Africa, Western”] OR [“Africa, Eastern”] OR [“Africa, Southern”] OR [“Africa”] OR [“Albania”] OR [“Algeria”] OR [“Angola”] OR [“Antigua”] OR [“Barbados”] OR [“Benin”] OR [“Burkina Fasso”] OR [“Burundi”] OR [“Cambodia”] OR [“Kampuchea”] OR [“Cameroon”] OR [“Cameroons”] OR [“Cameroon”] OR [“Cape Verde”] OR [“Central African Republic”] OR [“Chad”] OR [“Chile”] OR [“China”] OR [“Colombia”] OR [“Comoros”] OR [“Comoro Islands”] OR [“Comores”] OR [“Mayotte”] OR [“Congo”] OR [“Zaire”] OR [“Costa Rica”] OR [“Cote d’Ivorie”]
OR “Ivory Coast” OR Croatia OR Cuba OR Cyprus OR Czechoslovakia OR “Czech Republic” OR Slovakia OR “Slovak Republic” OR Djibouti OR “French Somaliland” OR Dominica OR “Dominican Republic” OR “East Timor” OR “East Timur” OR “Timor Leste” OR Ecuador OR Egypt OR “United Arab Republic” OR “El Salvador” OR Eritrea OR Estonia OR Ethiopia OR Fiji OR Gabon OR “Gabonese Republic” OR Gambia OR Gaza OR “Georgia Republic” OR “Georgian Republic” OR Ghana OR “Gold Coast” OR Greece OR Grenada OR Guatemala OR Guinea OR Guam OR Guiana OR Guyana OR Haiti OR Honduras OR Hungary OR India OR Maldives OR Indonesia OR Iran OR Iraq OR Jamaica OR Jordan OR Kazakhstan OR Kazakh OR Kenya OR Kiribati OR Korea OR Kosovo OR Kyrgyzstan OR Kirghizia OR Kyrgyz OR Kirghiz OR Kirgistan OR “Lao PDR” OR Laos OR Latvia OR Lebanon OR Lesotho OR Basutoland OR Liberia OR Libya OR Lithuania OR Macedonia OR Madagascar OR Malagasy OR Malaysia OR Malaya OR Malay OR Sabah OR Sarawak OR Malawi OR Nyasaland OR Mali OR Malta OR “Marshall Islands” OR Mauritania OR Mauritius OR “Agalega Islands” OR Mexico OR Micronesia OR “Middle East” OR Moldova OR Moldavia OR Moldovan OR Mongolia OR Montenegro OR Morocco OR Irin OR Mozambique OR Myanmar OR Myanmar OR Burma OR Namibia OR Nepal OR “Netherlands Antilles” OR “New Caledonia” OR Nicaragua OR Niger OR Nigeria OR “Mariana Islands” OR Oman OR Muscat OR Pakistan OR Palau OR Palestine OR Panama OR Paraguay OR Peru OR Philippines OR Philippines OR Philippines OR Poland OR Portugal OR “Puerto Rico” OR Romania OR Rumania OR Roumania OR Russia OR Russian OR Rwanda OR Ruanda OR “Saint Kitts” OR “St Kitts” OR Nevis OR “Saint Lucia” OR “St Lucia” OR “Saint Vincent” OR “St Vincent” OR Grenadines OR Samoa OR “Samoa Islands” OR “Navigator Island” OR “Navigator Islands” OR “Sao Tome” OR “Saudi Arabia” OR Senegal OR Serbia OR Montenegro OR Seychelles OR “Sierra Leone” OR Slovenia OR “Sri Lanka” OR Ceylon OR “Solomon Islands” OR Somalia OR Sudan OR Suriname OR Surinam OR Swaziland OR Syria OR Tajikistan OR Tadzhikistan OR Tadjikistan OR Tadzhik OR Tanzania OR Thailand OR Togo OR Togolese OR Tonga OR Trinidad OR Tobago OR Tunisia OR Turkey OR Turkmenistan OR Turkmen OR Uganda OR Ukraine OR Uruguay OR USSR OR “Soviet Union” OR “Union of Soviet Socialist Republics” OR Uzbekistan OR Uzbek OR Vanuatu OR “New Hebrides” OR Venezuela OR Vietnam OR “Viet Nam” OR “West Bank” OR Yemen OR Yugoslavia OR Zambia OR Zimbabwe OR Rhodesia OR “low- and middle- income”:ti,ab,kw OR “low income”:ti,ab,kw OR “low resource”:ti,ab,kw

Pubmed

**Concept 1. Mental Health**

(“Mental Health”[Mesh] or “mental health”[tiab] or “mental healthcare”[tiab] or “Mental Disorders”[Mesh] or “mental illness”[tiab] or “mental disorder”[tiab] or “mental disorders”[tiab] or “disabled”[tiab] or “disability”[tiab] or “disabilities”[tiab] or “Disabled Children”[Mesh] or “Disabled Persons”[Mesh] or “Mentally Disabled Persons”[Mesh] or “neurologic disorder”[tiab] or “Depression”[Mesh] or “depression”[tiab] or “Depressive Disorder”[Mesh] or “depressive”[tiab] or “depressed”[tiab] or “Stress Disorder, Post-Traumatic”[Mesh] or “PTSD”[tiab] or “Psychotic Disorder”[Mesh] or “psychosis”[tiab] or “psychoses”[tiab] or “psychotic”[tiab] or “Schizophrenia”[Mesh] or “schizophrenia”[tiab] or “Bipolar Disorder”[Mesh] or “bipolar”[tiab] or “Epilepsy”[Mesh] or “epilepsy”[tiab] or “Seizures”[Mesh] or “seizures”[tiab] or “Developmental Disabilities”[Mesh] or “Learning Disorders”[Mesh] or “Intelectual Disability”[Mesh] or “Autistic disorder”[Mesh] or “autism”[tiab] or “autistic”[tiab] or “Dementia”[Mesh] or “dementia”[tiab] or “Substance-Related Disorders”[Mesh] or “Substance Abuse, Intravenous”[Mesh] or “Marijuana Abuse”[Mesh] or “Cocaine-Related Disorders”[Mesh] or “Amphetamine-Related Disorders”[Mesh] or “substance abuse”[tiab] or “drug abuse”[tiab] or “overuse”[tiab] or “substance dependence”[tiab] or “drug dependence”[tiab] or “harmful use”[tiab] or “hazardous use”[tiab] or “Suicide”[Mesh] or “suicide”[tiab] or “self-harm”[tiab] or “mental retardation”[tiab] or “neurotic”[tiab] or “Alcoholism”[Mesh] or “Adjustment Disorders”[Mesh] or “Affective Disorders, Psychotic”[Mesh] or “psychotropic”[tiab] or “anxiolytics”[tiab] or “depressant”[tiab] or “epileptic”[tiab] or “mood stabilizers”[tiab] or “psycho-social support”[tiab] or “psychology”[tiab] or “psychological”[tiab] or “psychotherapy”[tiab] or “rehabilitation”[tiab] or “stigma”[tiab] or “support group”[tiab] or “cognitive therapy”[tiab] or “reality therapy”[tiab] or “behavior therapy”[tiab] or “behaviour therapy”[tiab] or “self-help group”[tiab] or “Self-Help Groups”[Mesh] or “Psychology”[Mesh] or “Psychotherapy”[Mesh] or “Counseling”[Mesh] or “Rehabilitation”[Mesh] or “Social Stigma”[Mesh] or “Resilience, Psychological”[Mesh] or “Discrimination (Psychology)”[Mesh].

**Concept 2. Community health workers**

(“health extension worker”[tiab] or “health extension workers”[tiab] or “Community Health Workers”[Mesh] or “community health worker”[tiab] or “community health workers”[tiab] or “community health aide”[tiab] or “home health aide”[tiab] or “community health representative”[tiab] or “community health representatives”[tiab] or “community networks”[tiab] or “peer
group"[tiab] or “lay volunteer”[tiab] or “lay worker”[tiab] or “lay health worker”[tiab] or “lay health workers”[tiab] or “lay health advisor”[tiab] or “lay health advisors”[tiab] or “barefoot doctor”[tiab] or “barefoot doctors”[tiab] or “peer to peer”[tiab] or “community based practitioner”[tiab] or “community based practitioners”[tiab] or “community-based practitioner”[tiab] or “community-based practitioners”[tiab] or “Accredited social health activist”[tiab] or “Accredited social health activists”[tiab] or “village health worker”[tiab] or “village health workers”[tiab] or “village health guide”[tiab] or “village health guides”[tiab] or “village health support guide”[tiab] or “village health support guides”[tiab] or “health auxiliary worker”[tiab] or “health auxiliary workers”[tiab] or “front-line health worker”[tiab] or “front-line health workers”[tiab] or “Shasthya Sebikas”[tiab] or “Community Outreach Worker”[tiab] or “Community Outreach Workers”[tiab] or “Peer counsellor”[tiab] or “Peer counsellors”[tiab] or “Peer counselor”[tiab] or “Peer counselors”[tiab] or “Peer Counsellour”[tiab] or “Peer Counsellors”[tiab] or “Promotora”[tiab] or “peer educator”[tiab] or “peer educators”[tiab] or “non-physician healthcare worker”[tiab] or “non-physician healthcare workers”[tiab] or “task-shifting”[tiab] or “task shifting”[tiab] or “task-sharing”[tiab] or “lay counselor”[tiab] or “lay counselors”[tiab])

Concept 3. LMICs

(Africa[tw] OR Afghanistan [tw] OR Albania [tw] OR Algeria [tw] OR Angola [tw] OR Antigua [tw] OR Barbuda [tw] OR Argentina [tw] OR Armenia [tw] OR Armenian [tw] OR Aruba [tw] OR Azerbaijan [tw] OR Bahrain [tw] OR Bangladesh [tw] OR Barbados [tw] OR Benin [tw] OR Byeloruss [tw] OR Byelorussian [tw] OR Belarus [tw] OR Belorussian [tw] OR Belize [tw] OR Bhutan [tw] OR Bolivia [tw] OR Bosnia [tw] OR Herzegovina [tw] OR Herzegovina [tw] OR Botswana [tw] OR Brazil [tw] OR Bulgaria [tw] OR “Burkina Faso”[tw] OR “Burkina Fasso”[tw] OR “Upper Volta”[tw] OR “Burundi”[tw] OR “Uruundi”[tw] OR Cambodia [tw] OR “Khmor Republic”[tw] OR “Kampuchea”[tw] OR “Cameroon”[tw] OR “Cameroons”[tw] OR “Cape Verde”[tw] OR “Central African Republic”[tw] OR Chad [tw] OR Chile [tw] OR China [tw] OR Colombia [tw] OR Comoros [tw] OR “Comoros Islands”[tw] OR Comores [tw] OR Mayotte [tw] OR Congo [tw] OR Zaïre [tw] OR “Costa Rica”[tw] OR “Cote d’Ivoire”[tw] OR “Ivory Coast”[tw] OR Croatia [tw] OR Cuba [tw] OR Cyprus [tw] OR Czechoslovakia [tw] OR “Czech Republic”[tw] OR Slovakia [tw] OR “Slovak Republic”[tw] OR Djibouti [tw] OR “French Somaliland”[tw] OR Dominica [tw] OR “Dominican Republic”[tw] OR “East Timor”[tw] OR “East Timur”[tw] OR “Timor Leste”[tw] OR Ecuador [tw] OR Egypt [tw] OR “United Arab Republic”[tw] OR “El Salvador”[tw] OR Eritrea [tw] OR Estonia [tw] OR Ethiopia [tw] OR Fiji [tw] OR Gabon [tw] OR “Gabonese Republic”[tw] OR Gambia [tw] OR Gaza [tw] OR “Georgia Republic”[tw] OR “Georgian Republic”[tw] OR Ghana [tw] OR “Gold Coast”[tw] OR Greece [tw] OR Grenada [tw] OR Guatemala [tw] OR Guinea [tw] OR Guam [tw] OR Guiana [tw] OR Guyana [tw] OR Haiti [tw] OR Honduras [tw] OR Hungary [tw] OR India [tw] OR Maldives [tw] OR Indonesia [tw] OR Iran [tw] OR Iraq [tw] OR Jamaica [tw] OR Jordan [tw] OR Kazakhstan [tw] OR Kazakh [tw] OR Kenya [tw] OR Kiribati [tw] OR Korea [tw] OR Kosovo [tw] OR Kyrgyzstan [tw] OR Kirghizia [tw] OR Kyrgyz [tw] OR Kirghiz [tw] OR Kirgizstan [tw] OR “Lao PDR”[tw] OR Laos [tw] OR Latvia [tw] OR Lebanon [tw] OR Lesotho [tw] OR Basutoland [tw] OR Liberia [tw] OR Libya [tw] OR Lithuania [tw] OR Macedonia [tw] OR Madagascar [tw] OR Malagasy [tw] OR Malaysia [tw] OR Malay [tw] OR Malay [tw] OR Sabah [tw] OR Sarawak [tw] OR Malawi [tw] OR Nyasaland [tw] OR Mali [tw] OR Mal [tw] OR “Marshall Islands”[tw] OR Mauritania [tw] OR Mauritius [tw] OR “Agalega Islands”[tw] OR Mexico [tw] OR Micronesia [tw] OR “Middle East”[tw] OR Moldova [tw] OR Moldova [tw] OR Moldovan [tw] OR Mongolia [tw] OR Montenegro [tw] OR Morocco [tw] OR “Ilni”[tw] OR Mozambique [tw] OR Myanmar [tw] OR Myanma [tw] OR Burma [tw] OR Namibia [tw] OR Nepal [tw] OR “Netherlands Antilles”[tw] OR “New Caledonia”[tw] OR Nicaragua [tw] OR Niger [tw] OR Nigeria [tw] OR “Mariana Islands”[tw] OR Oman [tw] OR Muscat [tw] OR Pakistan [tw] OR Palau [tw] OR Palestine [tw] OR Panama [tw] OR Paraguay [tw] OR Peru [tw] OR Philippines [tw] OR Philippines [tw] OR Philippines [tw] OR Poland [tw] OR Portugal [tw] OR “Puerto Rico”[tw] OR Romania [tw] OR Rumania [tw] OR Roumania [tw] OR Russia [tw] OR Russian [tw] OR Rwanda [tw] OR Ruanda [tw] OR “Saint Kitts”[tw] OR “St Kitts”[tw] OR Nevis [tw] OR “Saint Lucia”[tw] OR “St Lucia”[tw] OR “Saint Vincent”[tw] OR “St Vincent”[tw] OR Grenadines [tw] OR Samoa [tw] OR “Samoa Islands”[tw] OR “Navigator Island”[tw] OR “Navigator Islands”[tw] OR “Sao Tome”[tw] OR “Saout Arabia”[tw] OR Senegal [tw] OR Serbia [tw] OR Montenegro [tw] OR Seychelles [tw] OR “Sierra Leone”[tw] OR Slovenia [tw] OR “Sri Lanka”[tw] OR Ceylon [tw] OR “Solomon Islands”[tw] OR Somalia [tw] OR Sudan [tw] OR Suriname [tw] OR
Surinam [tw] OR Swaziland [tw] OR Syria [tw] OR Tajikistan [tw] OR Tadzhikistan [tw] OR Tadjikistan [tw] OR Tadzhik [tw] OR Tanzania [tw] OR Thailand [tw] OR Togo [tw] OR Togolese [tw] OR Tonga [tw] OR Trinidad [tw] OR Tobago [tw] OR Tunisia [tw] OR Turkey [tw] OR Turkmenistan [tw] OR Turkmen [tw] OR Uganda [tw] OR Ukraine [tw] OR Uruguay [tw] OR USSR [tw] OR “Soviet Union” [tw] OR “Union of Soviet Socialist Republics” [tw] OR Uzbekistan [tw] OR Uzbek [tw] OR Vanuatu [tw] OR “New Hebrides” [tw] OR Venezuela [tw] OR Vietnam OR “Viet Nam” [tw] OR “West Bank” [tw] OR Yemen [tw] OR Yugoslavia [tw] OR Zambia [tw] OR Zimbabwe [tw] OR Rhodesia [tw] OR (developing [TiAB] OR “less developed” [TiAB] OR “under developed” [TiAB] OR underdeveloped [TiAB] OR “middle income” [TiAB] OR “low income” [TiAB] OR “lower income” [TiAB] OR underserved [TiAB] OR “under served” [TiAB] OR deprived [TiAB] OR poor* [TiAB] AND (countr* [TiAB] OR nation* [TiAB] OR population* [TiAB] OR world [TiAB])) OR ((transitional [TiAB] OR developing [TiAB] OR “less developed” [TiAB] OR “lesser developed” [TiAB] OR “under developed” [TiAB] OR underdeveloped [TiAB] OR middle income [TiAB] OR “lower income” [TiAB] OR “lower income” [TiAB]) AND (economy [TiAB] OR economies [TiAB])) OR “low resource”[tiab] OR “low-resource”[tiab])