**Supplemental File 3: Main findings according to CFIR constructs**

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| **Construct** | | **Obstacles** | **Synergies** | **Implications** |
| **I. INTERVENTION CHARACTERISTICS** | |  |  |  |
| A | Intervention Source |  | PRIME intervention packages were designed, developed and implemented by the research team in concert and close collaboration with the ministries of health in Ethiopia, India, Nepal, South Africa and Uganda. In Nigeria, researchers from the consortium worked closely with local stakeholders to contextualise and implement an mhGAP intervention. | Across all country sites, close collaboration between the research team and local stakeholders during all implementation phases should result into stronger sustainability and stakeholder empowerment. |
| B | Evidence Strength & Quality |  | Country stakeholders were provided with PRIME and mhGAP materials and were informed of the evidence base of the materials. | In all country sites, stakeholder knowledge of evidence base for the intervention packages heightened belief in implementation success. |
| C | Relative Advantage | Instances emerged where intervention advantages were hamstrung by persisting health system challenges, for instance recurring supply chain management breaks resulting in a lack of psychotropic medications at facilities in Nigeria and Uganda. | In Ethiopia and India, expanding services to lower tier facilities were perceived to increase mental health awareness, improve diagnostics and decrease the financial burden of service access by mental health service users (MHSUs). In Nepal and Nigeria, stigmatising perceptions among health workers were largely improved following the introduction of PRIME and mhGAP packages, respectively. In Uganda, the PRIME package was seen to improve access to care in rural areas. In South Africa bolstering the mental health components of the Adult Primary Care (APC) manual in South Africa was perceived to substantially improve mental health case detection, management and referral. | Country intervention packages were appropriately tailored for the six respective contexts, though health system deficiencies hindered implementation at service provider level. The interventions also helped to identify and highlight system faults for overall improvement. |
| D | Adaptability | High staff turnover called for re-training of new incoming staff across some of the countries, particularly Nigeria and South Africa. In all country sites, concern was expressed regarding human resources shortages to implement the packages. | PRIME intervention packages were successfully adapted in Ethiopia, India, Nepal, South Africa and Uganda, and a contextualised mhGAP package was successfully trialled in Nigeria. | Funding and capacitation of existing specialists to provide re-training required to ensure follow-up training of new staff in all countries. |
| E | Trialability |  | The PRIME and Nigerian packages have been assessed through randomized controlled trials – with results pending |  |
| F | Complexity | Where the PRIME intervention packages involved collaborative care models, the level of complexity was greater. For example, in South Africa, referrals to psychologists were problematic, in that booking information was given to the external psychologist who in turn had to contact the patient; leaving the referring health worker unsure if the consultation took place and with little feedback. Similarly, no feedback was given after referrals to hospital-based social workers. | In South Africa, the APC manual was seen to be a vital tool to help navigate the complexities of integrated mental health care, and the referral/booking system between facilities and general practitioners were positively appraised. There was general support from all country sites that the intervention packages made the provisioning of integrated mental health care more simple and manageable, despite resource constraints. | Continuous quality improvement to identify problems in the implementation of the intervention package such as referral feedback bottlenecks could assist in the implementation of complex collaborative care packages, such as in South Africa |
| G | Design Quality & Packaging | In Nepal, it was mentioned that it would have been preferable if the intervention package had included anxiety given the high prevalence of anxiety disorders In South Africa, some participants indicated the need to have the package include substance use disorders more broadly than just the narrow focus on alcohol use disorders. | Participants from all countries assessed the intervention guidelines positively. For example, in Nigeria, it was mentioned that while mental health services were already part of its PHC package, using the mhGAP guidelines lent more structure and efficiency to mental health service provision. In South Africa, the intervention package was perceived to work well in concert with the roll-out of Integrated Clinical Services Management (ICDM). In India, using PHC-level health facilities assisted in building and maintaining relationships with MHSU, especially in rural areas. | There is a need for the integrated package to be more inclusive of other mental disorders as well. Other initiatives to develop integrated chronic service delivery processes are enabling of integrated mental health care |
| H | Cost | In Nepal, it was mentioned that a degree of dependency had developed on the resources from Transcultural Psychosocial Organization Nepal (TPO) and PRIME, especially human resources, potentially constraining the ability of the Nepal government to continue the programme in the same dosage. Similar sentiments were expressed in Uganda and in India. In Nigeria, local government did not provide adequate supplies of psychotropic medications, relying on external funding, which highlights sustainability issues. | In Ethiopia, the introduction of health insurance helped to foster access to care. Inclusion of psychotropic medication on the essential drug list in Nepal was a major advance in optimizing future sustainability of the integrated mental health package. | System deficiencies need to be addressed, specifically dedicated mental health funding for sustaining the integrated mental health package. PRIME and other similar integrated mental health care intervention programmes should withdraw from the respective countries gradually, with on-going technical support and mentorship of existing human resources important to sustain the integrated packages. |
| **II. OUTER SETTING** | |  |  |  |
| A | Patient Needs & Resources | The lack of community-based and family support was highlighted. Stigma, both in communities and in health facilities, was widely perceived to be a substantial barrier to integrated mental health care and was mentioned to be a challenge despite featuring in some of the intervention packages. In some country sites, for example, Nepal and Nigeria, drug stock-outs resulted in MHSUs’ needs not being met, both clinically and in terms of buying into mental health care. In South Africa, MHSUs’ were perceived to expect quick services, which is not always possible given resource constraints. In Uganda, it was mentioned that people suffering from alcohol use disorders were resistant to help-seeking and rarely turned up at facilities. | The intervention packages were perceived to alleviate patient concerns related to finances and time. In Ethiopia, India and South Africa, the PRIME intervention packages were perceived to bring mental health services closer to MHSUs. Across all countries, the multiple health conditions experienced by MHSUs seeking mental health care was mentioned, and it was indicated that the intervention packages were especially helpful in meeting these MHSUs’ needs. A participant from Ethiopia underlined the intertwined nature of mental health, economic and social challenges - that it can only be approached in an integrated collaborative way. | Renewed efforts to raise mental health literacy and combat stigma are required, especially in communities. Supply chain management should be strengthened so as to prevent stock-outs, especially in Nepal and Nigeria. Alcohol use disorders might require extra efforts to establish relationships of care between MHSUs and facilities. |
| B | Cosmopolitanism | While most participants underlined the primacy of multi-sectoral working, very little evidence emerged of planning, implementing and monitoring services across sectoral boundaries. | In Nepal, TPO used a strong relationship with government to lobby for mental health service scale-up and to assist in health system strengthening by providing training and human resource support. In South Africa, there was engagement with mental health societies that are NGOs linked to the Federation for Mental Health that represents user interests. | Local governance structures should be strengthened across all countries by establishing accountability measures for regular multi-sectoral mental health forums, including engaging with user groups. |
| C | Peer Pressure |  |  |  |
| D | External Policy & Incentives | In Uganda, poor supply chain management policies resulted in psychotropic drug shortages. A moratorium on appointing health workers in the South African site resulted in staff shortages generally that impeded staffing for integrated mental health care. At the time of writing, none of the countries had instituted a ring-fenced, dedicated mental health budget. Persistent common health system challenges were mentioned in all countries, especially a lack of governance and management capacity for implementing integrated mental health care, a lack of funding and staffing for mental health specialists to support task sharing and as a referral resource, and little inclusion of mental health in health information systems. | The introduction of health insurance in Ethiopia helped to increase access to mental health care. South Africa’s roll out of ICSM provided many synergies with integrated mental health care. In Nepal, inclusion of psychotropic medications on the free essential drug list helped improve access to treatment. CHW programmes provided a platform for the introduction of task-sharing in PHC facilities. Free PHC was a significant facilitator for intervention implementation and future scale-up across all the countries. | Policy changes leading to strengthening of the health system generally, such as introduction of health insurance, essential drug lists including psychotropic medication, and service delivery redesign for integrated chronic care management all provided a more enabling PHC platform for the integration of mental health. The need for a dedicated mental health budget at PHC level, however, still remained essential to ensure adequate human resources for mental health and to withstand external socioeconomic pressures, where mental health resources allocated from a general PHC budget were vulnerable to being used for other health priorities across all countries. |
| **III. INNER SETTING** | |  |  |  |
| A | Structural Characteristics | Although not a feature across all health facilities in the respective intervention sites, the lack of adequate private space for counselling was problematic. | Some participants appropriated rooms intended for different programmes for mental health counselling, for instance dental rooms, toilets or administrative offices in South Africa. | Facility managers from all country sites should be empowered in creative space management, to create mental health counselling spaces that provide an appropriate degree of privacy and confidentiality. |
| B | Networks & Communications | As previously mentioned poor feedback loops between primary and secondary care, hampered continuity of care in South Africa. Receiving feedback from district and provincial management regarding complaints, suggestions and performance were also largely absent in South Africa. In Uganda, a lack of routine discussions on the clinical aspects of mental health care was highlighted, and regular meetings were suggested to remedy this. | Networks between providers within PHC were perceived to be strong, for instance relationships between nurses and CHWs, as well as between nurses and doctors in South Africa; relationships between prescribers and non-prescribers in Nepal; inter-staff relationships and communication following mhGAP training in Nigeria. The hierarchical structure of communication ensured strong upward lines of communication from health facilities to local and provincial government management levels, as well as with drug dispensaries. Difficulties in following up on MHSUs who missed their appointments were addressed through strong relationships between health workers and MHSUs’ families, particularly in Nepal and Nigeria, where close contact was kept telephonically with MHSUs. | Feedback loops between primary and secondary care need to be strengthened in referral and communication systems, particularly in South Africa, while regular clinical discussions among staff could be fostered in Ugandan health facilities. The promise of mhealth technologies to catalyse these processes should be investigated further. |
| C | Culture | Hierarchical values did not always ensure a required degree of flexibility in the face of challenges, for instance dealing with drug shortages in Nigeria and in South Africa; with affected health facilities waiting on upper government levels to solve the shortage.  A lack of clan culture was exhibited in South Africa, highlighted by an absence of occupational support for PHC clinic staff, with employee assistance programmes seen as punitive rather than supportive. | Hierarchical cultural values were predominant in all countries, in line with the tiered nature of health systems in LMICs. This was exemplified by cascaded training (especially in India and Nigeria), drug dispensing (all countries), levels of governance in (Nepal, Nigeria, South Africa, Uganda), staffing and funding (Nigeria, South Africa and Uganda).  Clan cultural values emerged in Nepal, where regular staff meetings were made non-compulsorily, increasing flexibility and participation among all staff cadres. While work-related emotional challenges were also mentioned in Nigeria, a nurturing clan work environment was sketched where staff could share their emotional burdens with co-workers and line managers. Here, decision-making regarding MHSUs was also presented as a group effort, enhancing shared responsibility and buy-in. | In some country contexts, there needs to be a shift from bureaucratic transactional leadership styles to more transformative ones, to foster more flexibility in organisational culture in dealing with challenges. A stronger clan-based culture can help alleviate occupational stress related to mental health service provision in South Africa. |
| D | Implementation Climate |  |  |  |
| 1 | Tension for Change | In some countries, like South Africa, several interventions of different scale and scope were being rolled out simultaneously, with various degrees of control and quality. Although there was a recognition of the need for change, this was reported to have been done without sufficient consultation with staff and was at times overwhelming for staff. | Participants from all countries understood the need for integration of mental health to improve access, reduce stigma and alleviate the mental health burden in communities. | Given the on-going health system reforms in the six target countries, it is important to adapt integrated models of mental health care to existing systems. The influence of broader health system challenges and degree of readiness of the health system for integration should also be considered in the timing of future scale-up efforts. |
| 2 | Compatibility | Given the chronic nature of mental disorders and the instability of drug prices and availability, the long-term ability of MHSUs to adhere to psychopharmacological treatment was questioned in Ethiopia. In Nepal, Nigeria and Uganda, drug stock-outs were also a concern. In Nepal, long-term compatibility was a concern, given the central role of TPO in its health system. | Integrated mental health care benefited from established health system features, for instance the regular provision of health information to MHSUs in Nepal, and the strong use of CHWs in South Africa and Nigeria. Also, in South Africa, the Integrated Chronic Disease Management programme provided an enabling platform for integration of mental health care. Most country health workers had received at least basic mental health care training prior to the intervention. All country health systems had in place referral systems to specialised services. | In all countries, strategic use of specialist resources should be fostered, and supply chain management strengthened, supported by a dedicated mental health budget. Implementation of chronic care systems provides an enabling platform for integration as highlighted in South Africa. |
| 3 | Relative Priority | Some instances emerged that mental health is not adequately prioritised compared to other health programmes, for instance in South Africa, where a lack of district-level mental health coordinators was noted. This was further supported by the lack of dedicated mental health funding across all country sites. | There was general consensus among participants in all countries regarding the importance and necessity of integrated mental health care as an intervention. | All countries should have dedicated mental health budgets and local governance structures in place. |
| 4 | Organisational Incentives & Rewards | In Nepal and Uganda, some health workers were portrayed as participating in training for self-promotion rather than truly buying into the broader programme. Individual ambitions led to staff moving to other areas of the country health systems, promoting higher staff turn-over. | The training and specialist support from PRIME facilitators in India and in Nepal was a particularly important incentive to programme implementation. In Ethiopia, integrated care helped health workers to achieve their goal in providing human rights-based care. In South Africa, guideline documents made day-to-day patient management easier and promoted better patient flow in health facilities, while being simple enough for all health worker cadres to understand and follow. Having referral pathways to facility-based counsellors also improved motivation to identify and refer patients with common mental disorders. | The balance between individual and programme ambitions requires careful consideration, particularly in Nepal and Uganda. |
| 5 | Goals and Feedback | In line with the hierarchical structure of the country health systems, mental health information was sent (mostly monthly) to a centralised facility, though very little feedback was provided to health facilities, particularly in Ethiopia, Nigeria and South Africa. | Voluntary staff meetings in Nepal health facilities were a primer for goal communication and feedback, as were monthly compulsory meetings in Nigeria. | Local governance structures need to be strengthened to provide regular and structured programme feedback to health facilities, across all countries. Continuous quality improvement that promotes the use of data at a local level to improve services provides a potential mechanism to address the current lack of feedback and would also help incentivize implementation of integrated mental health care |
| 6 | Learning Climate |  | Across all countries, facility managers were appreciative of the utility of the guidelines document to assist them in good clinical decision-making. PRIME and mhGAP training was positively assessed, and many were willing to undergo additional training. This was especially mentioned in India, where regular training and support from PRIME was requested. In South Africa, learning about integrated mental health care streamlined well with training in Integrated Chronic Disease Management. | The learning climate across all sites was generally positive, possibly due to on-going health reforms and service adjustments in these health systems. |
| E | Readiness for Implementation |  |  |  |
| 1 | Leadership Engagement | In many countries, leadership on local/district level was lacking; in Nepal, there was a lack of “direct” supervision, most supervision occurred telephonically. In South Africa, Nigeria and Uganda, it was mentioned that attempts to engage upper levels of government regarding resource shortages were met by indifference. In these countries, there was “paper-based” leadership (relying on the provision of policies and plans) with little physical presence in health facilities. In Nigeria, it was mentioned that upper government levels lacked awareness of the mhGAP programme. | Across all countries, the ministries of health were instrumental bodies in facilitating implementation processes, according to hierarchical levels of responsibility. | Facility managers from all sites should be empowered to provide transformative leadership in the face of challenges such as human resource constraints and drug stock-outs. Local levels of mental health governance should be improved, along with fostering better communication and feedback with health facilities. |
| 2 | Available Resources | Participants across all country sites highlighted resources shortages, including general as well as specialist human resources for mental health, supplies of psychotropic medications, and funding constraints. Staff turnover was a particular obstacle to integration, since in several sites replacement staff were not well informed about the intervention packages. | CHWs were perceived to be a lynchpin to integrated mental health care in Nepal, Nigeria and South Africa, although in Uganda they were mentioned to be more established in HIV programmes. | A ring-fenced, dedicated mental health budget emerged as a crucial mechanism with which to ensure a stable flow of resources towards mental health care across all country sites. |
| 3 | Access to Knowledge & Information |  | While country participants were not comprehensively informed of the broader implementation processes of PRIME and mhGAP, they were closely involved in the intervention development and implementation processes in the respective countries. | Strong ties between implementers and country partners ensured that stakeholders had a good degree of access to knowledge and information. |
| **IV. CHARACTERISTICS OF INDIVIDUALS** | |  |  |  |
| A | Knowledge & Beliefs about the Intervention | Across all country contexts, there were mixed views on task sharing, with some respondents viewing caring for people with mental illness as the role of mental health specialists, even after training, with others viewing it as an additional burden. | In Ethiopia, integrated mental health care reduced personal costs of MHSUs by eliminating the need to travel great distances to hospitals for care, while in South Africa, it was mentioned that integrated mental health care helped to promote more person-centred care. | The need for change management to orientate managers and providers to the benefits of integrated care for MHSUs and providers alike is highlighted. |
| B | Self-efficacy |  | In general, participants reported to be more assured in effectively dealing with mental disorders in PHC settings following PRIME and mhGAP interventions. | Across all countries, the interventions reportedly improved stake holders’ self-efficacy in providing integrated mental health care. |
| C | Individual Stage of Change |  | While there was a general sense that stakeholders’ self-efficacy, confidence and capabilities improved in providing integrated mental health care, some participants, for instance in South Africa, Nepal and Nigeria, recommended regular refresher training and supervision by the research teams. | On-going refresher training and support is important, particularly for South Africa, Nepal and Nigeria. |
| D | Individual Identification with Organisation |  | All country stakeholders were firmly embedded in their respective ministries of health. | In general, stakeholder identification with the values of health departments were largely aligned. |
| E | Other Personal Attributes | In all countries, participants suggested that some health workers exhibited stigmatising attitudes and discriminatory behaviours towards people suffering from mental disorders. Some participants from South Africa positioned PHC as being largely curative focused, neglecting its preventative role in the health system. In Uganda, cultural understandings of mental disorders in some cases led to misdiagnosis and mismanagement | In Nepal, facility managers played a mediating role between professional and non-professional staff, as well as between facility staff and MHSUs. | There is a persisting need for on-going health worker awareness programmes to reduce psychiatric stigma across all country sites. |
| **V. PROCESS** | |  |  |  |
| A | Planning |  | Interventions across country sites were planned in close consultation with health ministry stakeholders from national down to local levels of governance. | Close collaboration with key stakeholders assisted in contextualised implementation of intervention packages in the six country sites. |
| B | Engaging |  |  |  |
| 1 | Opinion Leaders | In Nigeria, during drug stock-outs, it was highlighted that MHSUs sought alternative health services, including traditional medicine, which in some cases aggravated symptoms. This presents an identified need to engage better with traditional medicine practitioners and community leaders. |  | Further engagement with traditional healers, influential community leaders and opinion leaders situated outside the public health system should be considered, particularly in Nigeria. |
| 2 | Formally Appointed Internal Implementation Leaders |  | The emphasis on facility managers was important. Given the hierarchical nature of the health sector, facility managers tended to wield a substantial amount of influence over frontline workers. | Facility managers emerged as crucial stakeholders in the success of integrated mental health care across the six countries, requiring on-going support given broader health system constraints. |
| 3 | Champions |  |  |  |
| 4 | External Change Agents |  | In Ethiopia, India, Nepal, South Africa and Uganda, the PRIME research team was instrumental in driving the intervention development and implementation processes. In Nigeria, the EMERALD team, and in Nepal, TPO, were also key external change agents. An NGO hospital in Ethiopia was also instrumental in supporting integrated mental health care. |  |
| C | Executing | Broader system dynamics influenced the implementation processes in some cases, for instance psychotropic drug stock-outs in Nigeria, Nepal and Uganda, and a moratorium on the appointment of health workers in South Africa. A slow government response in terms of instituting local mental health governance structures, promoting multi-sectoral strategizing and creating dedicated mental health budgets further dented optimal implementation of intervention packages in the respective countries. | Very little negative sentiments were expressed in terms of implementation fidelity, outputs, outcomes and experiences, across all countries. | Broader system influences are a real and important consideration in the implementation of health system interventions in the real-world contexts of the countries, raising the importance of on-going stakeholder consultation, empowerment of key staff members to engage with changing conditions and emerging challenges, and intervention flexibility that characterises continuous quality improvement |
| D | Reflecting & Evaluating | Some participants from Ethiopia and South Africa indicated that integrated mental health care should attract more MHSUs to the health system, which will in turn require more resource mobilisation by governments. | The implementation of PRIME and mhGAP intervention packages were positively assessed across all country sites, including in terms of reducing mental health stigma, promoting more person-centred care, increasing the quality of care, improving mental health priority, reducing MHSU costs when seeking care, and improving mental health confidence and capabilities of health workers. | The sustainability and long-term success of integrated mental health care across countries will be significantly reliant on dedicated mental health budgets and local governance structures to guide and promote mental health services in PHC settings. |