

A task shifting approach to primary mental health care for adults in South Africa: human resource requirements and costs for rural settings

Inge Petersen,^{1*} Crick Lund,² Arvin Bhana,^{1,3} Alan J Flisher⁴ and the Mental Health and Poverty Research Programme Consortium⁵

¹School of Psychology, University of KwaZulu-Natal, Howard College, Durban, South Africa, ²Department of Psychiatry and Mental Health, University of Cape Town, South Africa, ³Child, Youth, Family and Social Development Programme, Human Science Research Council, Durban, South Africa, ⁴Division of Child and Adolescent Psychiatry and Adolescent Health Research Unit, University of Cape Town, South Africa and ⁵Consortium partners are Alan J Flisher (Director) and Crick Lund (Co-ordinator) (University of Cape Town, Republic of South Africa (RSA)); Therese Agossou, Natalie Drew, Edwige Faydi and Michelle Funk (World Health Organization); Arvin Bhana (Human Sciences Research Council, RSA); Victor Doku (Kintampo Health Research Centre, Ghana); Andrew Green and Mayeh Omar (University of Leeds, UK); Fred Kigozi (Butabika Hospital, Uganda); Martin Knapp (University of London, UK); John Mayeya (Ministry of Health, Zambia); Eva N Mulutsi and Sifiso Phakathi (Department of Health, RSA); Sheila Zaramba Ndyababangi (Ministry of Health, Uganda); Angela Ofori-Atta (University of Ghana); Akwasi Osei (Ghana Health Service); and Inge Petersen (University of KwaZulu-Natal, RSA).

*Corresponding author. School of Psychology, University of KwaZulu-Natal, Howard College, Durban, South Africa. Tel: +27–31–2607970. Fax: +27–31–2602618. E-mail: peterseni@ukzn.ac.za

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Background A recent situational analysis suggests that post-apartheid South Africa has made some gains with respect to the decentralization and integration of mental health into primary health care. However, service gaps within and between provinces remain, with rural areas particularly underserved.

Aim This study aims to calculate and cost a hypothetical human resource mix required to populate a framework for district adult mental health services. This framework embraces the concept of task shifting, where dedicated low cost mental health workers at the community and clinic levels supplement integrated care.

Method The expected number and cost of human resources was based on: (a) assumptions of service provision derived from existing services in a sub-district demonstration site and a literature review of evidence-based packages of care in low- and middle-income countries; and (b) assumptions of service needs derived from other studies.

Results For a nominal population of 100 000, minimal service coverage estimates of 50% for schizophrenia, bipolar affective disorder, major depressive disorder and 30% for post-traumatic stress disorder and maternal depression would require that the primary health care staffing package include one post for a mental health counsellor or equivalent and 7.2 community mental health worker posts. The cost of these personnel amounts to £28 457 per 100 000 population. This cost can be offset by a reduction in the number of other specialist and non-specialist health personnel required to close service gaps at primary care level.

Conclusion The adoption of the concept of task shifting can substantially reduce the expected number of health care providers otherwise needed to close mental health service gaps at primary health care level in South Africa at minimal cost and may serve as a model for other middle-income countries.

Keywords Primary mental health care, task shifting, human resources, cost, low- and middle-income countries

KEY MESSAGES

- Adopting a task-shifting approach to the integration of mental health into primary health care can substantially reduce the expected number of health care providers otherwise needed to address service gaps in South Africa.
- The cost of additional community-based workers and a mental health counsellor at primary level, to provide supervision and support, is offset by a reduction in the number of other specialist and non-specialist health personnel required to close the service gaps.

Introduction

A deinstitutionalized and integrated primary mental health care system is essential for increasing access, improving service quality within a human rights framework and restructuring mental health services in post-apartheid South Africa. These strategies are contained in the White paper for the transformation of the health system (Department of Health 1997a), policy guidelines for mental health care (Department of Health 1997b), and more recently stipulated in the new Mental Health Care Act, no. 17, of 2002 (MHCA) (Department of Health 2004).

A recent situational analysis of mental health services in South Africa, conducted as part of the Mental Health and Poverty Project (MHaPP), suggests that while there has been progress towards decentralized integrated primary mental health care since 1997, there are still significant service gaps both within and across provinces (Lund *et al.* 2009a; Petersen *et al.* 2009). Progress includes the introduction of a 72-hour observation and referral service for emergency psychiatric patients in designated general hospitals in line with provisions within the Mental Health Care Act; the introduction of at least one psychotropic medicine for each psychiatric therapeutic category on the essential drug list (EDL) within primary health care (PHC) clinics; and symptom management of psychiatric patients by PHC nurses. Disability grants are also available for people with severe psychiatric conditions, a key financial strategy for their integration back into the community.

Gaps still exist with respect to psycho-social rehabilitation programmes, which are unevenly delivered, with rural areas being particularly under-served; insufficient support for PHC clinic nurses in emergency management of psychiatric patients; and irregular and inconsistent identification and treatment of more common mental disorders such as depression and anxiety disorders. Further, aside from awareness programmes, interventions for the promotion of mental health and the prevention of mental disorders are rare (Lund *et al.* 2009a; Petersen *et al.* 2009).

Within the context of South Africa's resource constraints as an upper middle-income country, there is a need to develop a human resource service package which addresses these gaps at primary care level. For the purposes of this study a set of priority mental disorders in adults was chosen that includes schizophrenia, bipolar disorder, major depressive disorder,

maternal depression and post-traumatic stress disorder (PTSD). These disorders were prioritized on the basis of: (a) the high burden of impairment if care is not provided; (b) evidence of unmet need; and (c) available and evidence-based effective interventions that can be provided at primary care level within the resource constraints of LMICs.

Schizophrenia and bipolar disorder have traditionally been prioritized given the high level of impairment if not treated. In the context of a treatment gap of 75% for common mental disorders in South Africa (Williams *et al.* 2008), major depressive disorder (MDD) was prioritized given that it is the most prevalent 12-month individual mental disorder (4.9%) among adults (Williams *et al.* 2008). Maternal depression was included given two separate studies found postnatal and antenatal depression to be particularly high, 35% (Cooper *et al.* 1999) and 41% (Rochat *et al.* 2006), respectively. PTSD was included given South Africa's high rates of trauma related to inter-personal violence (Seedat *et al.* 2009a), with epidemiological studies indicating that PTSD rates are elevated in trauma associated with assault (Breslau 2002).

The development of the proposed package in this study is based on the framework contained in Figure 1, which embraces the concept of task shifting. This refers to the training of non-specialist health workers in the provision of health care services under the supervision of scarce specialist health personnel as a mechanism to compensate for the shortage of specialists in LMICs and facilitate scaling up of health services at minimal cost (WHO 2006; Lancet Global Mental Health Group *et al.* 2007; WHO 2008). The roles and functions of the different service providers within the framework are contained in Table 1.

Entry into the district health care system can occur at all of the first three tiers depicted in Figure 1. The first tier comprises the community level of care, serviced by a range of different sectors, including NGOs, private practitioners, social workers, as well as non-professional community care-givers, such as community health workers (CHWs), traditional healers and spiritual leaders. An innovation in this tier which differentiates it from previous frameworks (e.g. Robertson *et al.* 1997; Petersen *et al.* 2000; Mkhize *et al.* 2004) is the introduction of posts for dedicated community mental health workers (CMHWs). As reflected in Table 1, these workers would be responsible for initiating psychosocial rehabilitation programmes and self-help groups for people with schizophrenia and bipolar disorders to assist in their re-integration into the community, as well as

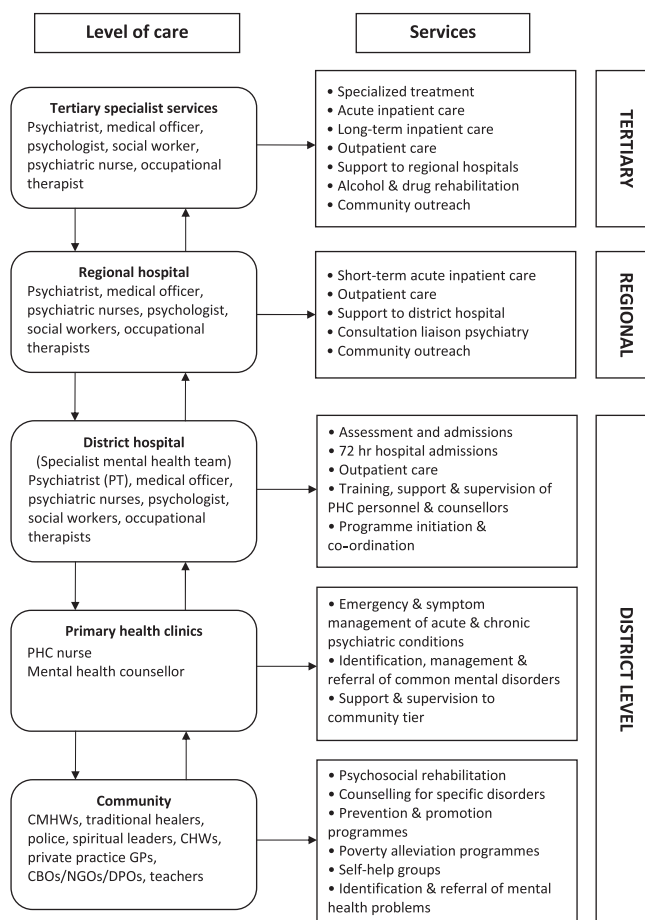


Figure 1 Framework of tiers of care for primary mental health care services

manualized psychological treatments for MDD and maternal depression under the supervision of specialist mental health practitioners located at the second and third tiers. In support of this task-shifting approach, a Ugandan study using trained community-based workers to successfully deliver group interpersonal therapy (IPT) (Bolton *et al.* 2003) to people with depression has been adapted recently for the South African context over 12 sessions, with promising results (Petersen *et al.*, undated); Rahman *et al.* (2008) demonstrated the effective use of trained Lady Health Workers in Pakistan to deliver individual cognitive behaviour therapy to women with maternal depression over 16 sessions, Chatterjee *et al.* (2009) used trained community-based facilitators in India to successfully run a monthly community-based rehabilitation programme.

In the context of an already overburdened PHC system in South Africa as a result of high HIV prevalence (Chopra *et al.* 2009), there is a need for dedicated CMHWs to undertake to deliver these specific packages as general CHWs reportedly do not have the time to provide specific treatment packages for mental disorders (Petersen *et al.* 2009). However, training general CHWs in the identification of mental disorders and supportive counselling skills can reportedly strengthen their capacity to deal with emotional problems they encounter in their daily work, as well as improve identification and referral of people with mental disorders (Petersen *et al.* 2010a).

The second tier comprises the PHC clinic level of care, serviced largely by PHC nurses who rarely conduct home visits or engage in community level activities because of high workloads. An innovation at this tier is posts for mental health counsellors which, in South Africa, could be filled by a new cadre of mental health specialists who have a 4-year Bachelor of Psychology degree (B. Psych.), some of whom have been specifically trained to fill the gap in the availability of psychological services at the primary care level (Petersen 2004; Elkonin and Sandison 2006). At this tier, PHC nurses would be responsible for emergency and symptom management of patients with acute and chronic psychiatric conditions, as well as identification and referral of patients with common mental disorders to the mental health counsellor. Previous research suggests that they do not have the time to provide psychological treatment for service users with common mental disorders (Freeman and Pillay 1997; Petersen 2000; WHO and Wonca 2008; Petersen *et al.* 2009). PHC nurses would continue to provide emergency management and referral of service users with acute psychiatric conditions as well as psychotropic symptom management of psychiatric patients with severe chronic conditions as suggested by previous frameworks, but with greater support and supervision from psychiatric nurses at the district hospital level—who in turn would receive support and supervision from a consultant psychiatrist for complicated cases. The introduction of Integrated Management Guidelines (IMG), a desktop guide to assist PHC nurses and doctors in the identification and management of common health complaints presenting at PHC level, is currently being developed to include mental health (personal communication, Ms Sibanyoni, Directorate of Mental Health Services, South African Department of Health, 2009) and should greatly assist in this process as well as in the identification of commonly overlooked anxiety and depressive disorders and their referral to the mental health counsellor.

Mental health counsellors, in addition to providing a training, supervisory and supportive role to CMHWs, would: (a) screen and provide onward referral for more severe cases of depression and PTSD to the district hospital tier for medication or more specialized counselling; (b) screen and provide downward referral of cases of depression to the community tier for participation in specific manualized interventions run by CMHWs; and (c) provide a referral counselling service, using structured evidence-based counselling approaches, for PTSD. On the basis of evidence-based trauma counselling interventions, a minimum of four counselling sessions is suggested (Sijbrandij *et al.* 2007; Neuner *et al.* 2008; Bisson and Andrew 2009).

The third tier constitutes the district hospital referral level of care within districts, serviced largely by medical officers and scarce mental health specialists such as psychologists, psychiatric nurses and consultant psychiatrists. Medical officers with the assistance of psychiatric nurses and a consultant psychiatrist are largely responsible for assessment, diagnosis, inpatient admissions and onward referral to the district psychologist or regional and specialist tertiary psychiatric hospitals. These hospitals are reflected in the fourth and fifth tiers of the framework in Figure 1, but do not form part of the district package and hence this study. Within the context of task shifting, a major innovation at this tier is diversification of the roles of mental health specialists to include training,

Table 1 Assumption of services provided by different health care providers

Health provider	Services
District hospital tier	
Psychiatrist	<ul style="list-style-type: none"> • Consultation for medical officer and other mental health specialists. • Referral psychiatric service for confirmation and adjustment of diagnoses and treatment regimes for more complex psychiatric cases seen at the district hospital.
Clinical psychologist	<ul style="list-style-type: none"> • Referral psychological service for patients requiring more complex psychological treatments. • Training, supervision and support for psychiatric nurses, mental health counsellor and the community mental health workers. • Attending district mental health management meetings.
Dedicated psychiatric nurses	<ul style="list-style-type: none"> • Conduct an initial mental status examination and provide a provisional diagnosis of all outpatient psychiatric patients admitted to the outpatient department of the district hospital. • Onward referrals to the clinical psychologist, medical officer or consultant psychiatrist for confirmation of diagnosis and treatment. • Trauma counselling for non-fatal suicides and forensic cases, mainly rape, including the provision of post-rape HIV prophylactic treatment, counselling for termination of pregnancy and onward referral to the district surgeon and/or psychologist. • Training and support of primary health care nurses in the emergency management and ongoing psychopharmacological treatment of psychiatric patients. • Training and support of community mental health workers in facilitating psychosocial rehabilitation groups for service users with chronic severe mental disorders. • Attending district mental health management meetings.
Social workers	<ul style="list-style-type: none"> • Assisting psychiatric patients in their applications for disability grants. • Assisting in escorting psychiatric patients to regional or tertiary level institutions.
Medical officers	<ul style="list-style-type: none"> • Confirmation (where possible) of diagnosis of psychiatric patients. • Exclusion or management of comorbid medical conditions. • Prescription and management of medication. • Onward referral of complex cases to psychiatrist and psychologist.
District mental health co-ordinator	<ul style="list-style-type: none"> • Plan, manage and monitor entire district mental health system.
District information officer	<ul style="list-style-type: none"> • Plan, manage and monitor the mental health components of the district information system.
Primary health care clinic tier	
Primary health care nurse	<ul style="list-style-type: none"> • Emergency management and referral of patients with acute psychiatric conditions to the district hospital. • Ongoing symptom management of chronic psychiatric conditions. • Identification and referral of cases of depression and post-traumatic stress disorder (PTSD) to the mental health counsellor.
Mental health counsellor	<ul style="list-style-type: none"> • Referral counselling service for PTSD. • Screening and onward referral of more severe mental disorders to district hospital. • Screening for cases of depression and downward referral to the community tier for participation in specific manualized interventions run by community mental health workers. • Training and support for community mental health workers at the community tier.
Community tier	
Community mental health workers	<ul style="list-style-type: none"> • Provision of specific manualized and structured group-based interpersonal therapy (IPT) for general depression. • Provision of specific manualized and structured individually-based IPT for maternal depression. • Facilitate psychosocial community-based rehabilitation programmes for people with schizophrenia and bipolar mood disorder.

support and supervision of personnel at the PHC clinic and community tiers. Further, as indicated in Table 1, at this tier, the district mental health co-ordinator would work with the district information officer to plan, manage and monitor the district mental health system. Given the multisectoral nature of mental health services, this planning and management structure should ideally be multisectoral and incorporate a number of sectors besides health, including representatives from the social development, education, criminal justice and social security government sectors as well as NGOs and civil society, private practitioners (including traditional healers), and municipal and tribal local authorities.

While calculations of human resource packages have been previously developed for people with severe psychiatric conditions (Lund and Flisher 2006), those receiving outpatient services, day services and community residential care (Lund and Flisher 2009), and children and adolescents (Lund *et al.* 2009b), these earlier packages have not incorporated the same task shifting approach. The specific aim of this study was thus to calculate and cost the hypothetical human resource mix required to populate the integrated primary mental health care framework described above for adults, with a specific emphasis on the resource requirements and cost of the innovative task shifting aspects.

Method

Target population and characteristics

Data used to develop the service package were drawn from a district and sub-district in a rural area in the north of the KwaZulu-Natal province where elements of the district mental health system framework depicted in Figure 1 were implemented as a demonstration project. The district has a population of approximately 500 000 people and covers 12 819 km², while the sub-district is approximately 1417 km², having an estimated population of approximately 228 000. The district is similar to many other rural parts of South Africa, including areas administered by a municipal authority (township and some peri-urban sections) and more rural areas administered by a tribal authority. The catchment area for assessing the resource requirements for the proposed framework was limited to the Demographic and Health Surveillance Area (DSA) within the sub-district. The area is 438 km² in size and includes a population of approximately 85 000 people who make up approximately 11 000 households. Given high rates of circular migration typical of rural areas, about one-third of this population resides outside the area, with the population according to the Africa Centre Demographic Information System (ACDIS) in 2001 comprising 29 305 males (44%) and 36 951 females (56%) (Nyirenda *et al.* 2007). As is typical of most rural areas, unemployment and out-migration of young adults, particularly males, is high, with 57% of the total population comprising children and adolescents (0–19 years). There are also large variations in population densities in the area ranging from 2000 to 3000 people/km² (Tanser *et al.* 2008).

The DSA site is serviced by the sub-district hospital to which six PHC clinics are linked. Clinics are located in township and peri-urban areas as well as more remote rural areas, where service users may have to travel longer distances to access health care.

Model

A spreadsheet model, derived from the model developed to calculate human resource requirements for community mental health services in South Africa (Lund and Flisher 2009), was developed to estimate minimum and maximum human resource requirements for different packages of care at the different tiers within the district mental health system for a nominal population of 100 000. With the exception of MDD, this study utilized the same estimates for minimal coverage calculated by Lund and Flisher (2009), which were based on a range of scenarios in consultation with provincial mental health co-ordinators and the national Directorate: Mental Health and Substance Abuse in South Africa. Different disorders make varying demands on the health care system. Schizophrenia and bipolar disorder, for instance, make significant demands given the greater visibility and impairment associated with them than common mental disorders which may be less easily identified (Chisholm *et al.* 2007) and where help-seeking behaviour in South Africa has been historically low given low mental health literacy and limited access to services for these disorders (Petersen *et al.* 2010a). However, in the context where MDD is the most prevalent individual 12-month mental disorder (Williams *et al.* 2008), and where it has the potential to hinder

containment of South Africa's HIV pandemic as a result of its association with increased transmission rates and poor anti-retroviral therapy (ART) adherence (Shrier *et al.* 2002; Smit *et al.* 2006; Amberbir *et al.* 2008), the minimal coverage for MDD was increased to 50% in this study.

The model incorporated the following steps.

Step 1: Expected need for mental health services

Estimates of the need for mental health services for MDD and PTSD were drawn from epidemiological data from the nationally representative SASH study (Williams *et al.* 2008). For schizophrenia and bi-polar disorder, estimates of need were drawn from estimates of prevalence in the Western Cape province, based on a review of local and international epidemiological studies (Kleintjes *et al.* 2006). As the SASH study did not differentiate maternal depression specifically, an estimate of the need for mental health services for this disorder was based on local prevalence data on maternal depression in the study site obtained from three antenatal clinics (Rochat *et al.* 2006), with the denominator calculated using Statistics South Africa (2009) data of the number of births in South Africa in 2008 as a percentage of the total female population. Details of the expected cases per year in the local district are provided in Table 2.

Step 2: Assumptions of service provision

Assumptions about service packages required at each tier were based on (a) estimates of expected need contained in Table 2; (b) existing service utilization patterns in the demonstration sub-district; (c) assumptions about service provision by service providers at the different tiers based on evidence-based packages of care described in the introduction.

Step 3: Expected staff needs

Based on the assumptions utilized in steps 1–2, as well as South African workload studies at PHC level (Rispele *et al.* 1996), step 3 calculated the staff needs at the different tiers of care. At the community care tier it was assumed that CMHWs would run psychosocial rehabilitation groups for people with severe mental disorders on a monthly basis (minimum 5.4 groups per week; maximum 10.8 groups per week), and IPT groups for people with depression on a weekly basis for a 12-week period (minimum 13.7 groups per week, maximum 45.5 groups per week). Full-time equivalent (FTE) staff numbers were calculated using the following formula: FTE staff = groups per week / groups per CMHW per week. CMHWs would also conduct individual counselling for maternal depression. Based on four antenatal counselling sessions and 14 postnatal home visits, this was calculated to be 3016 visits at minimum cover and 10 053 visits at full cover per year. FTE staff numbers were calculated using the following formula: FTE staff = (daily patient visits (DPV)/consultations per staff per day) × (working days per year/staff working days per year). Staff working days per year were determined after excluding holidays and sick leave.

At the PHC clinic tier, it was assumed that general PHC nurses would have monthly visits for symptom management of people with schizophrenia and bipolar affective disorders as well as once-off screening and referral of patients with major

Table 2 Estimated adult need for mental health services for selected disorders per 100 000 population at district level, using various data sources

Disorder, adults	1 year prevalence (%)	Comorbidity adjustments	Total number expected in population	Minimum coverage ^b	Full coverage ^c
Schizophrenia	1	1	430	215	430
Bipolar affective disorder	1	1	430	215	430
Major depressive disorder	4.9	4.2	1822	547	1822
Post-traumatic stress disorder	0.6	0.5	223	67	223
Maternal depression ^a	40	40	838	251	838
Total	7.5	6.7	2905	1044	2905

^aMaternal depression is calculated on 40% of pregnant women (Rochat *et al.* 2006) and assuming 4% of South African women give birth per year (Statistics South Africa 2008). NB: Maternal depression numbers are not included in the total.

^bFor adults, minimum coverage is the minimal recommended service provision and represents a weighted percentage of schizophrenia (50%), bipolar affective disorder (50%), major depressive disorder (50%), post-traumatic stress disorder (30%), maternal depression (30%).

^cFull coverage is service provision for 100% of people with selected mental disorders.

depression and maternal depression (5958 visits at minimum cover and 12 979 visits at full cover per year). FTE staff numbers were calculated using the following formula: FTE staff = (daily patient visits/consultations per staff per day) × (working days per year/staff working days per year). FTE staff numbers for the mental health counsellors were calculated assuming that they would have once-off assessment sessions with people with major depression for onward referral for either medication or group counseling as well as four consultations for trauma counselling of people with PTSD (814 visits at minimum cover and 2714 at full cover per year). In addition, FTE staff numbers for mental health counsellors included calculations for training, supervision and support functions using the following formula: FTE staff = (total hours spent in supervision for IPT groups + CMHW supervision + PHC nurse supervision + CMHW training + District Mental Health Team meeting per week)/working hours per week. It was assumed that the mental health counsellor would provide supervision to one IPT group per day, provide group supervision and support to CMHWs once a week, provide training to CMHWs for 4 weeks of the year and attend monthly District Mental Health Team meetings.

At the district hospital tier, FTE staff numbers for psychiatric nurses, medical officers and the psychologist were calculated using the same formula as nurses at the PHC clinic tier. Based on service usage in the study sub-district, for these staff categories it was assumed that there would be one visit a year by patients with bipolar affective disorder, schizophrenia and PTSD and that only severe cases of major depressive disorder (34.3%) would be referred for medication (684 patients would be seen at minimum cover and 1708 at full cover per year). The psychiatric nurse would spend more time with each patient (12 consultations per day, including history taking, mental state examination, and provisional diagnosis), while the medical officer would see more patients (25 per day, to confirm diagnosis and write a prescription or refer to a psychiatrist). It was assumed that 20% of outpatient department (OPD) patients would be referred to the psychologist (based on local experience at the study site), leading to 137 annual visits at minimum

cover and 342 at full cover, and assuming 3 full clinic days per week, with the rest of the time spent in supervision and training.

Supervision, training and support functions for the psychiatric nurses and psychologist at the district hospital were calculated using the same formula as that for the mental health counsellors fulfilling these functions at the PHC clinic tier. It was assumed that the psychiatric nurses would provide weekly support and supervision to CMHWs involved in running psychosocial rehabilitation groups, provide weekly support and supervision for PHC nurses, spend 4 weeks per year training CMHWs in psychosocial rehabilitation and 1 week a year training PHC nurses in the identification and management of mental disorders, as well as attend monthly district mental health management team meetings. For the psychologists, it was assumed that they would have weekly support and supervision meetings with the mental health counsellors and psychiatric nurses, spend 4 weeks a year training the CMHWs in group and individual counselling for depression, spend approximately 1 week developing/revising training materials, as well as attend monthly meetings of the district mental health management team.

It was assumed that the psychiatrist would visit the district on a monthly basis, during which he/she would conduct day clinics. Ten per cent of complicated OPD patients would be referred to the psychiatrist (based on local experience at the study site), leading to 68 annual visits at minimum cover and 171 at full cover, with the rest of the time spent in supervision of the medical officers (2 hours per month).

In the inpatient unit, bed numbers were calculated using the following formula: beds = number of cases × (% needing residential care in a year/100) × (average length of stay/365) × rotation factor. It was assumed that 8% of those with schizophrenia, bipolar affective disorder and major depression would require admission per year, with an average length of stay of 3 days, and a rotation factor of 1.05 (assuming 95% bed occupancy). Using the assumptions of cases per year (from Table 1), one bed would be required at minimum cover and two beds at full cover. FTE staff numbers were calculated assuming

staff/bed ratios of 1/30 for medical officers, 1/10 for general nurses and 1/20 for psychiatric nurses.

In addition, managerial requirements for the district were assumed to be as follows. For the Mental Health Co-ordinator (psychiatric nurse): 0.2 FTE at minimum cover and 0.5 FTE at full cover; the Deputy Mental Health Co-ordinator (psychiatric nurse): 1 FTE at minimum cover and 4 FTEs at full cover; and for the Information Management Officer: 0.5 FTE at minimum cover and 2 FTEs at full cover.

Step 4: Expected staffing costs

Based on expected staff needs calculated in step 3 and utilizing current salary scales for the different staff categories, the staffing costs by staff category of the proposed district mental health system was calculated per 100 000 population. These were based on 2009 Department of Health salaries for the KwaZulu-Natal province, and included rural allowances, scarce skills allowances and benefits.

Results

Based on FTEs, minimum and maximum expected staffing requirements for the packages of care, as well as managerial aspects at the different tiers, are provided in Table 3. For a population of 100 000, and using minimum coverage figures, posts for existing mental health specialists within the system were estimated to be 1.6 posts for psychiatric nurses, 0.3 of a post for a psychologist and 0.4 of a post for a psychiatrist. As reflected in Table 3, of the posts for psychiatric nurses, 1.2 were allocated to managerial functions, given that psychiatric nurses typically co-ordinate the mental health programmes at district level. Half an information manager's post would also be required. With respect to minimum staffing requirements from general health care workers, the equivalent of 1.8 PHC nursing posts would be required, and 0.1 of a medical officer's post. The innovative aspects of shifting specific psychological treatment packages and psychosocial rehabilitation to mental

health counsellors and CMHWs was calculated to require one full-time post for a mental health counsellor or equivalent and 7.2 community mental health worker posts within the PHC staffing package.

Expected staffing costs for the entire district mental health system are contained in Table 4. Table 4 shows that based on FTEs, for a population of 100 000 at minimal coverage, the cost of the innovative aspects of shifting specific psychological treatment packages and community-based rehabilitation to mental health counsellors and CMHWs within the framework amounts to £28 457 per 100 000 population. These costs are, however, offset by a reduction in the cost requirements of more expensive specialist staff who otherwise would need to undertake these tasks. The gaps in mental health service delivery in rural resource-scarce settings in South Africa can thus be closed at minimal cost through adopting a task shifting approach which reduces the relative use of more expensive specialist staff, a key driver of the cost of mental health services.

Key uncertainties of this model relate to the capacity of local CMHWs to deliver the specific treatment packages, the availability of more specialist staff, especially mental health counsellors, to provide key supervisory and supportive roles, and the capacity and willingness of district health management to devote time of general PHC staff and resources to the integration of these services within general PHC. Given that posts for mental health counsellors do not currently exist within the PHC package in South Africa, substitution of existing staff within the system, such as psychiatric social workers or specialist psychiatric nurses, into this key role may be possible, but a careful assessment of local needs and capacity would be required to ensure that these core functions are maintained.

Discussion

Innovations of the proposed human resource package for closing the treatment gaps for prioritized mental disorders lies in task shifting to a new cadre of less skilled but dedicated

Table 3 Total staffing needs based in full-time equivalents (FTEs) per 100 000 population

Type of professional	Community tier		Primary health care clinic tier		District hospital tier		Managerial		Total (staff/population)	
	Minimum cover	Full cover	Minimum cover	Full cover	Minimum cover	Full cover	Minimum cover	Full cover	Minimum cover	Full cover
Community mental health workers	7.2	22.7							7.2	22.7
Nurse			1.8	3.8	0.1	0.2			1.8	4
Psychiatric nurse					0.4	0.9	1.2	4.5	1.6	5.4
B.Psych. counsellors			1	2.4					1	2.4
Social workers ^a									0	0
Psychologists					0.3	0.6			0.3	0.6
Medical officers					0.1	0.4			0.1	0.4
Psychiatrists					0.4	1			0.4	1
Information manager							0.5	2	0.5	2
Total	7.2	22.7	2.8	6.3	1.4	2.9	1.7	6.5	13.1	38.4

^aStaffing needs for social workers were not calculated given that the case study site suggests that they have minimal involvement with mental health patients; they were found to assist only 3% of outpatient department patients in accessing grants.

Table 4 Total staff costs based on full-time equivalents (FTEs), in pound sterling^a

Type of health provider	Community tier		Primary health care clinic tier		District hospital tier		Managerial		Total	
	Minimum cover	Full cover	Minimum cover	Full cover	Minimum cover	Full cover	Minimum cover	Full cover	Minimum cover	Full cover
Community mental health workers	14 158.64	44 389.73	0.00	0.00	0.00	0.00	0.00	0.00	14 158.64	44 389.73
General nurse	0.00	0.00	13 032.58	28 392.13	497.73	1366.88	0.00	0.00	13 530.31	29 759.01
Psychiatric nurse	0.00	0.00	0.00	0.00	5425.71	10 810.65	14 755.03	55 331.36	20 180.73	66 142.01
B.Psych. counsellors	0.00	0.00	14 298.38	34 069.84	0.00	0.00	0.00	0.00	14 298.38	34 069.84
Social workers ^b	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Psychologists	0.00	0.00	0.00	0.00	4671.89	7698.07	0.00	0.00	4671.89	7698.07
Medical officers	0.00	0.00	0.00	0.00	3746.14	9495.17	0.00	0.00	3746.14	9495.17
Psychiatrists	0.00	0.00	0.00	0.00	10 206.34	24 984.86	0.00	0.00	10 206.34	24 984.86
Info manager	0.00	0.00	0.00	0.00	0.00	0.00	8430.50	33 722.00	8430.50	33 722.00
Total	14 158.64	44 389.73	27 330.96	62 461.97	24 547.81	54 355.63	23 185.53	89 053.36	89 222.94	250 260.69

^aRand to pound sterling was calculated at R12 to £1.

^bStaffing needs for social workers were not calculated given that the case study site suggests that they have minimal involvement with mental health patients; they were found to assist only 3% of outpatient department patients in accessing grants.

mental health workers at the community and PHC clinic tiers to provide evidence-based packages of care.

The results suggest that CMHWs can be employed at minimal cost to the health care system (£14 159 per 100 000 population). As described in the methods section, there is sufficient evidence from LMICs that community-based workers can be trained to successfully provide specific interventions to reduce the identified gaps in services for depression and psychosocial rehabilitation (Bolton *et al.* 2003; Rahman *et al.* 2008; Chatterjee *et al.* 2009). Further, a feasibility study using trained CMHWs in rural South Africa to provide group IPT for PHC clinic patients with moderate to severe depressive symptoms produced promising results, with group uptake and retention being fairly good (77%) (Petersen *et al.*, undated).

Adequate training, supervision and emotional and technical support are, however, paramount to the success of this approach (Saraceno *et al.* 2007). While mental health counsellors with a B.Psych. qualification in South Africa are well placed to assist in the provision of support and supervision for psychological interventions for depressive disorders given their psychological training, as well as being more affordable than psychologists, posts for this cadre have yet to be created within the public health care system. As already mentioned, in the absence of such posts, an equivalent cadre of mental health specialist, such as psychiatric social workers or specialist psychiatric nurses could possibly be deployed to fulfill these functions at the PHC clinic level.

The results suggest that the other training, support and supervision functions necessary to support the task shifting approach can be absorbed into existing post structures. Based on FTEs for minimum and maximum coverage, besides managerial staffing needs and with the exception of psychiatrists, adopting the concept of task shifting substantially reduces the expected number of other health care providers that were previously calculated for community-based mental health services in South Africa, using different assumptions that did not

incorporate the same task shifting approach (Lund and Flisher 2009). Further, given that the additional cadres of health workers are less specialized, the total cost of the minimum package is also substantially reduced.

The adoption of this package is also likely to result in a cost saving to the health care system through a reduction in the number of health visits made by people with these disorders as a result of appropriate care and treatment. Previous studies in LMICs indicate that common mental disorders are associated with increased health care costs and reduced productivity and that treating these disorders leads to improved clinical and economic outcomes (Patel *et al.* 2003; Patel *et al.* 2007a). Further, psychosocial rehabilitation has been shown to assist in improved treatment adherence, strengthening social integration and reducing stigma and discrimination, all of which are important for improving clinical and social outcomes for patients with severe chronic conditions such as schizophrenia and bipolar disorders (Patel *et al.* 2007b).

Limitations of the proposed model include firstly, that the assumptions used in this study were based on controlled studies demonstrating the effectiveness of task shifting for specific treatment packages for different disorders. Studies demonstrating the effectiveness of integrated packages of care using a task shifting approach as proposed in this model are needed. A second limitation is that task shifting in real world settings runs the risk of community-based workers and general health care workers being tasked with the provision of treatment packages without adequate training, supervision and support, which has often been a critique of CHW programmes (Lehman *et al.* 2009) and runs the risk of inferior care being provided. A third limitation is the omission of anxiety disorders besides PTSD from the model, specifically agoraphobia, generalized anxiety, panic disorder and social phobia. Evidence-based treatments adopting a task shifting approach in LMICs could not be sourced. Additionally, the omission of substance misuse disorders as well as neurological

disorders such as dementia and epilepsy are further limitations. Substance misuse disorders presents a particular challenge; the SASH study indicates that service use by people with substance use disorders is lower than for people with anxiety and depressive disorders (Seedat *et al.* 2009b). The need for future studies to expand this model to incorporate these problems is thus indicated.

Lastly, mental disorders in children as well as mental health promotion and prevention interventions are not included in the model. Their inclusion will demand that the modelling exercise expands beyond the health sector to incorporate the human resource requirements for other sectors, particularly education and social development. In particular, given the centrality of poverty-related factors to the development and maintenance of mental disorders, particularly in LMICs (Lund *et al.* 2010), early childhood development projects, family strengthening projects, school retention programmes as well as poverty alleviation efforts are just some of the multisectoral endeavours that would be required in respect of mental health promotion and prevention in South Africa (Petersen *et al.* 2010b).

Conclusion

The proposed primary mental health care service package provides the opportunity to systematically address the mental health service gaps within the existing PHC package in South Africa as identified in the situational analysis conducted by MHaPP, at minimal cost. While there is a continued need to increase the evidence base of the cost-effectiveness of using community level non-specialist human resources to deliver mental health treatment and care, the emerging evidence from efficacy trials in LMICs is positive. Of critical importance, however, is the need to ensure that this cadre of worker is supported systemically through a hierarchical structure, as provided for in the proposed service package. In the absence of this support, the adoption of a task shifting approach is unlikely to succeed as mental health work requires both technical and emotional support and can lead to burn-out in unsupported contexts.

While posts for specific resources described in this study, such as mental health counsellors, may not exist in South Africa or in other LMICs, it may be possible to deploy equivalent personnel from existing resources to these roles in South Africa and elsewhere. What is key is that the conceptual underpinnings of task shifting contained in the model are retained, with modification to suit local needs and the resource constraints of specific resource settings.

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Ethical clearance

University of Cape Town and University of KwaZulu-Natal.

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