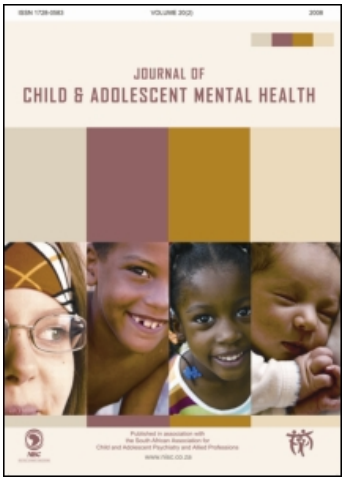

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Commentary

Improving child outcomes through maternal mental health interventions

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This commentary will provide a general overview of the public health considerations of maternal mental illness, both from a global perspective as well as from the South African context. The paper will outline the consequences of maternal mental illness for mothers as well as their offspring, through the life stages from pregnancy until adulthood. The paper then describes the Perinatal Mental Health Project (PMHP), an intervention that addresses maternal mental health in Cape Town, South Africa. The evidence emerging from this example contributes to the case for integrating maternal mental health into the mainstream health environment.

Maternal mental illness: an introduction

Common mental disorders during the antenatal period have been associated with poor perinatal outcomes for both mothers and their children. This is particularly relevant in low-resource settings where there is limited access to health facilities (Hanlon *et al*. 2009). According to the WHO Programme for Maternal Mental Health and Child Health and Development, maternal mental illness poses significant challenges to society. The burden of mental illness is not only faced by women, but also affects their children, their families and society in general (WHO 2008). The adverse and enduring human, social and economic consequences of maternal mental illness demands concerted action from health planners and policy developers (Prince *et al*. 2007, Rahman and Creed 2007, Rochat *et al*. 2008).

Maternal mental illnesses, particularly common mental disorders (CMD) such as depression and anxiety, are endemic in low-income and informal settings (Saxena *et al*. 2007). A review of the literature shows that South African levels of maternal mental illness are higher than developed countries and other developing states (Tomlinson *et al*. 2009).

A study by Cooper *et al*. (1999) found that 35% of women had postnatal depression in a low-income, township setting. Rochat *et al*. (2006) reported 41% antenatal depression in a low-income, rural area. The rate of postnatal depression in developed countries ranges between 10–15%, with a high variation between populations. Many studies cite rates of 13% in developed countries (Dennis *et al*. 2009, Gorman *et al*. 2004, Grote *et al*. 2010, Leahy-Warren and McCarthy 2007, Warner *et al*. 1996).

Mental illnesses are proven risk factors for numerous other physical health problems, such as HIV infection (Prince *et al*. 2007). On the other hand, physical health problems may lead to the development of mental illnesses (Repetti, Taylor and Seeman 2002). Thus, it can be seen that mental illnesses directly affect progress toward achievement of the Millennium Development Goals (MDGs) (Prince *et al*. 2007).

Although the South African Mental Health Act (2002) states mental healthcare should be integrated into routine primary care, such services are not yet available in the maternal care environment.

The consequences of maternal mental illness

There is a growing body of literature suggesting that untreated antenatal anxiety and depression may have adverse long-lasting physical, cognitive, and emotional effects for the foetus, infant, and child (Cooper *et al*. 1999, Enoch 2006, Hanlon *et al*. 2009, Saasa-Modise *et al*. 2000, Murray *et al*. 2003, Oates 2002, O'Connor *et al*. 2002, Onozawa *et al*. 2001, Patel *et al*. 2004, Rahman 2002, Talge, Neal and Glover 2007, Tomlinson *et al*. 2006).

Outcomes for pregnancy, labour and neonatal period

Psychological disorders constitute significant obstacles to health-seeking behaviour in mothers. Mothers experiencing psychological distress are less likely to access antenatal care and PMTCT (Rahman *et al*. 2004, WHO 2009) and are less likely to respond timeously to diarrhoeal episodes in their infants (Clemens *et al*. 1999, Hanlon *et al*. 2009, Lusskin, Pundiak and Habib 2007, Rahman *et al*. 2007).

Price and Proctor (2009) have linked maternal mental illness to increased admission to neonatal care units, higher rates of infectious illness and hospital admissions, and diminished completion of recommended immunisation schedules. Such consequences are consistently associated with infant mortality and loss of developmental potential in children under five years (Engle *et al*. 2007).

Psychological distress in mothers may lead to a higher incidence of miscarriage, bleeding during pregnancy, higher rates of Caesarean-section delivery, pre-term delivery and prolonged labour (Hanlon *et al*. 2009, Lusskin *et al*. 2007). In addition, these mothers are more likely to delay or discontinue breastfeeding early (Hanlon *et al*. 2009). Delayed initiation of breastfeeding has been associated with a number of adverse outcomes: increased early neonatal mortality, more diarrhoeal episodes (Clemens *et al*. 1999), failure to establish breastfeeding, and impaired mother-infant bonding (WHO 1998).

With respect to mothers' well-being, studies show an increased likelihood of mothers' self-medication with alcohol or drugs, reduced sleep and appetite, and poor antenatal weight gain (Cooper *et al*. 1999, Enoch 2006, Saasa-Modise *et al*. 2000, Murray *et al*. 2003, Oates 2002, O'Connor *et al*. 2002, Onozawa *et al*. 2001, Rahman 2002, Patel *et al*. 2004, Talge *et al*. 2007, Tomlinson *et al*. 2006). The recent *Report on Confidential Enquiries into Maternal Deaths in South Africa* found that mental illness is increasingly contributing to maternal mortality (DoH 2007).

Infant and child development

In South Asia, two recent cohort studies found associations between antenatal CMD and low birth weight (Patel and Prince 2006, Rahman *et al*. 2007). Feldman *et al*. (2000) emphasise that low birth weight is a primary cause of infant mortality and morbidity.

In rural Bangladesh, Black *et al*. (2009) found that infants of mothers with depressive symptoms experience poor linear growth (stunting). The findings showed that at six months, 18% of infants were stunted, with 36.9% of infants being stunted at 12 months; and the infants of mothers with depressive symptoms had a greater risk of being stunted than infants of mothers with few symptoms (45.3% compared with 27.6%) (Black *et al*. 2009).

Children of depressed mothers are more likely to be malnourished (Saasa-Modise *et al*. 2000) and experience gastro-intestinal problems (Price and Proctor 2009). Maternal mental illness has been found to have a detrimental impact on a woman's ability to care optimally for her child (Bonari *et al*. 2004, Patel *et al*. 2003, Rahman *et al*. 2004).

Long-term impacts

Untreated maternal depression may cause hormonal alterations in the intrauterine environment that have implications for infant and child cognitive development (Bergman *et al*. 2007, Bonari *et al*. 2004, Krstic *et al*. 2007, Oates 2002, Talge *et al*. 2007). Specifically, studies indicate that untreated antenatal depression can have detrimental effects on the language development of young

children (Bonari *et al*. 2004). A study by LaPlante *et al*. (2004) found that exposure to antenatal stress accounted for the toddlers' 11% variance on the Bayley Mental Developmental Index (MDI), 12% variance of their productive language abilities, and 17% variance of their receptive language abilities. This is supported by Bergman *et al*.'s (2007) observation of 22% variance in Bayley MDI scores at 18 months, which may be accounted for by the effect of stressful antenatal life events.

Antenatal distress has also been negatively linked to processes of recognition, memory, and adaption to stress (Krstic *et al*. 2007). A prospective study by Van den Bergh *et al*. (2005) on the cognitive functioning of adolescents (14 and 15 years) demonstrates the ongoing, long-term and negative consequences for children of mothers with antenatal anxiety.

Further consequences of maternal mental illness which may affect the long-term development of children include: genetic vulnerability for the development of alcoholism (Enoch 2006); decreased motor skills (Price and Proctor 2009); alterations to the Hypothalamic Pituitary Adrenal (HPA) axis (Charil *et al*. 2010, Glover and O'Connor 2002); and the development of asthma in later childhood (Cookson *et al*. 2009).

Mental illness begets mental illness: the intergenerational cycle of mental illness

Maternal depression and anxiety during pregnancy seem to have independently adverse effects on the emotional and psychological development of the child (Austin and Leader 2000, Glover and O'Connor 2002). Examples of these effects include: increased crying and irritability in the infant (Bonari *et al*. 2004); hyperactivity (Austin 2004, Bonari *et al*. 2004); fearfulness in infancy (Bergman *et al*. 2007); low frustration threshold, unsocial behaviour, schizophrenia and inconsolability (Bonari *et al*. 2004, Wisner *et al*. 1999). Infants whose mothers suffer from depression have been found to have reduced brain electrical activity across the left frontal lobe, a region of the brain associated with positive emotions such as joy (Wisner *et al*. 1999).

The British longitudinal ALSPAC study (Golding *et al*. 2001) (n = 7448), generated significant associations between maternal antenatal anxiety and several outcomes in four-year-old children, such as: conduct problems, inattention-hyperactivity, and anxiety symptoms (O'Connor *et al*. 2002). Postnatal maternal depression is also associated with child antisocial behaviour symptoms, including conduct problems and antisocial personality traits (Kim-Cohen *et al*. 2005).

Recent research from a range of disciplines shows the potentially detrimental effects of untreated maternal depression on the mother-infant bond. Healthy attachment is critical for the development of key brain regions in the newborn, such as development of the right frontal pathways involved in self-regulation of behaviour and emotion (WHO 2009).

A study by Obel (2003) specifically demonstrated that exposure to stressful events during pregnancy doubled the infant's risk for developing Attention Deficit Hyperactivity Disorder (ADHD) symptoms. In addition, Van den Bergh and Marcoen (2004) linked antenatal maternal anxiety with symptoms of ADHD in children of eight to nine years old.

Studies have found that an antenatal maternal diagnosis of panic disorder and depression is associated with neurophysiological profiles in the infant indicative of greater arousal (i.e. elevated saliva cortisol concentrations). These profiles are also found in adolescents and adults experiencing the onset of a major depressive episode (Bergman *et al*. 2007). In addition, maternal anxiety and stress during pregnancy have been connected to children's externalising (aggression and acting out) and internalising behaviour (anxiety, emotional inhibition and mood lability) (Obel 2003, O'Connor *et al*. 2002, Rodriguez and Bohlin 2005, Van den Bergh and Marcoen 2004). Infants of mothers with CMD show emotional and behavioural profiles which have been linked to shyness and anxiety disorders in late childhood (Davis *et al*. 2004, as cited in Talge *et al*. 2007).

Mental illness increases the risk of adolescent pregnancy and pregnancy in adolescents confers a greater risk of mental illness than in adults. A US study found that depressive symptoms in adolescent mothers were associated with a 44 percent increase in risk of subsequent pregnancy within 24 months of a birth (Barnet 2008). Piyasil and Meemarayatr (1998) found higher rates of postnatal depression among teenagers (38%) than adults (24%). In a South African study, multiple modelling showed that both forced sexual initiation and unwillingness to confront an unfaithful partner were strongly

associated with pregnancy in adolescents, and were also related to each other (Jewkes, Abrahams and Mvo 2001, Joyner 2009). In South Africa, recent maternal mortality data shows a clustering of suicides in the nulliparous and under-20 age group (DoH 2007). This suggests that adolescent pregnancies, which are also often first pregnancies, are associated with stress and mental illness.

Patel, Flisher and McGorry (2007) note that approximately 75% of mental disorders in adulthood have onset in youth, and persistent disorders in adulthood tend to be those with onset during the formative 12–24 age group. In South Africa: one in three girls has had a baby by the age of 20 (Health Systems Trust 2010); of girls in the 15–19 age group, 39% have ever been pregnant (Health Systems Trust 2010).

The Perinatal Mental Health Project (PMHP)

The Perinatal Mental Health Project has, for eight years, partnered with public health services to integrate mental healthcare into regular maternal care. The experience of the Project corresponds with global literature on the prevalence and causes of maternal mental illness. The Project provides an integrated maternal mental health intervention in the context of low-resource, high HIV-prevalence and overstretched clinical settings. This approach aims to be preventative for a range of postnatal mental and physical health problems, for both mother and child. The PMHP model shows that maternal mental health services are not only necessary but also feasible, and do not necessarily require many additional resources.

The PMHP promotes maternal mental health and prevents maternal mental illness by partnering with public health services to integrate mental health into routine maternal care. It provides a comprehensive programme through free, on-site screening, counselling and psychiatric services. Mental health capacity building with a range of health workers is central to these programmes. The Project's research component generates evidence and good practice models for service integration. Evidence also serves the PMHP's mental health advocacy and policy development work.

The PMHP addresses the mental health of women during pregnancy, at the same site where they receive antenatal care. This pragmatic approach is based on three key factors. Firstly, even the poorest and most vulnerable women tend to utilise obstetric services in South Africa. In this country, facility-based antenatal coverage is 92% (UNAIDS and WHO 2009). Secondly, women in the antenatal period generally have increased contact with service providers compared to other times in their lives. Thirdly, the prevalence of major depressive disorder in women is highest during the childbearing years (Kessler *et al*. 2003). More specifically, pregnancy is a time when women experience an increased rate of onset of depression (Buist *et al*. 2002).

The Project is based at a primary care antenatal facility in Cape Town, South Africa. Health workers are trained to conduct mental health screening as a routine part of the antenatal service. The Project funds one full time psychologist at this site. Additionally, two counsellors are available to provide services in isiXhosa and French. The facility serves women from low-income areas in the broader Cape Town area. The PMHP also works closely with community-based maternity staff in the peri-urban areas around the city.

Emerging evidence from the PMHP

Preparation and support of the maternal care environment

The PMHP has learnt that in order to develop a new integrated mental health service, the maternal health environment needs to be well prepared. Key to this process is the capacity building of maternity staff. This process needs to take into account:

1. The mental health needs of staff.
2. The morale of staff.
3. The mental health literacy of staff.
4. The need for staff's ongoing training in mental health matters.
5. The predominant style of interpersonal communication between staff and patients, including the cultural and political factors that underpin this style.
6. The need for ongoing supervision of staff's mental health roles.

The PMHP found that relationship-building with maternity staff is crucial to the smooth functioning of the service. One approach to relationship-building is through training. Once they have developed basic skills and have instituted service systems, maternity staff express a sense of relief, empowerment and greater morale.

This is significant because in the South African setting, nurses often experience the same distress as their clients, coming from similar social circumstances. This has contributed to high levels of client abuse by health workers in obstetric settings (Jewkes *et al.* 1998). Participatory training methods should acknowledge maternity staff's own mental health needs to ensure their ability to provide compassionate healthcare. The Project's ongoing training and consultation with maternity staff shows increasing acceptance of and support for the integration of maternal mental health services.

Prevalence of pathology and risk

Up until July 2010, the PMHP's service site had screened 8 534 women, counselled 1 329 and provided psychiatric services to 111 women.

One of the Project's main findings is that, of pregnant women screened routinely, 34% qualify for referral to the Project's psychological services (n = 2 843). This corroborates the findings of prevalence studies cited in this article. Of those women seen by a counsellor, 10% were referred to and seen by the Project's psychiatrist.

Project data shows that, of women who attend PMHP counselling services: 69% experience some form of abuse, either previously or currently; 69% report an unsupportive partner; and 39% report an unsupportive family.

Chi-squared analysis of PMHP data (n = 1008 women) shows that pregnant adolescents are more significantly associated with qualifying for referral on the basis of screening ($p < 0.05$) and are also more likely to decline to take up the referral ($p < 0.05$).

Screening

The South African setting requires a context-specific mental health screening tool. The PMHP has used the Edinburgh Depression Scale (EDS) (Cox, Holden and Sagovsky 1987) for screening. However, it has proven too cumbersome in terms of time expenditure and user-acceptability for routine use in over-stretched, busy antenatal clinics, or in the community setting.

The Project has developed a Risk Factor Assessment (RFA) tool, which it uses in combination with the EDS. It was developed based on the global literature and the PMHP's multi-disciplinary clinical experience. However, this tool has not yet been validated.

Based on analysis of data from 1 000 clients, a shortened version of the RFA is intended to address the deficiencies of the EDS in local settings. This brief five-item risk factor screening tool was piloted in five midwife units in townships around Cape Town in 2007. The pilot study revealed that the tool is acceptable to both staff and clients and that the midwife units are feasibly able to incorporate this screening tool routinely into the client booking process. The PMHP is conducting a formal validation study to examine the external validity of this tool. Further, the study will help to determine *when* to screen by taking into account the stage during clinic procedures that women learn their HIV status.

Dedicated on-site counselling

The PMHP has shown that a dedicated, on-site counsellor is critical to the success of a mental health intervention. In low-income settings, a dedicated, on-site counsellor maximises women's access to mental health services by being able to schedule counselling sessions that coincide with antenatal appointments, and respond to emergencies. In addition, an on-site counsellor can coordinate the service, ensuring optimal tracking of defaulters and follow-up of vulnerable clients.

Promoting maternal mental health: the argument for mainstreaming

In sub-Saharan Africa, MDG4 outcomes (reduce mortality of children under five years) have worsened, and MDG5 outcomes (improve maternal health by reducing maternal mortality per 100 000 live births by 75%) have not improved (Chopra *et al*. 2009).

The primary causes cited for these failures in development correspond with the outcomes of untreated maternal mental illness cited in this paper. Thus, a pragmatic approach to addressing MDG 4 and 5 would be for health planners and policy-makers to address maternal mental illness.

Interventions promoting maternal mental health are cost-effective, feasible and preventative. Global data on treating depression show significant reductions in general healthcare costs (Patel et al. 2003, Schoenbaum et al. 2001, Simon et al. 2001). Attempts to evaluate costs in adult depression have put savings at US$10 000 to $35 000 per depressed person per year (Schoenbaum et al. 2001). In comparison, the cost of the screening, if introduced into routine care, is likely to be significantly lower. The indirect cost of mental disorders outweighs direct treatment cost by two to six times in developed countries and may be even higher in developing countries. In the first nationally representative survey of mental disorders in South Africa, lost earnings among adults with severe mental illness during the previous 12 months amounted to R28.8 billion This represents 2.2% of GDP in 2002, and far outweighs the direct spending on mental healthcare for adults (of approximately R472 million) (Petersen *et al.* in press). It costs less to treat mental illness than to ignore it.

Most importantly, mental illness is usually treatable (Schneider *et al*. 2004). Risk factors for maternal mental illness are known, and there is good evidence to show that risks for postnatal mental illness are identifiable antenatally (Austin 2004, Dennis 2003, Mauri *et al*. 2010, Milgrom *et al*. 2008, O'Hara and Swain 1996, Stewart *et al*. 2003, Stowe, Hostetter and Newport 2005).

Integrated antenatal interventions can maximise the contact women have with mental health services, particularly for women in impoverished settings who may access health services more frequently during pregnancy. Integration of services is most relevant for women living in adversity who may face many barriers to accessing healthcare. Travel costs or time away from employment or child-care responsibilities may be minimised when maternity care is provided at the same time and place as mental healthcare. Thus, these interventions use existing services and resources to achieve better coverage, with minimal extra costs. Furthermore, integration may overcome some of the barriers to service access that are associated with mental health stigma.

Mental health promotion during pregnancy has been shown to result in beneficial HIV/AIDS outcomes in terms of treatment and prevention for both mother and child (Rochat *et al*. 2006). Better mental health is associated with better antiretroviral adherence in HIV-positive women (Schneider *et al*. 2004), especially those living in conditions of social adversity (Mellins *et al*. 2003). This is noteworthy because HIV has been directly linked to maternal depression, and the effects of this on caregiving ability have been well documented (Rochat *et al*. 2008).

In South Africa, the prevalence for any diagnosable mental disorder, among people living with HIV/AIDS, is 43.7% (Ciesla and Roberts 2001, Freeman *et al*. 2008). This is significantly higher than the background population 12-month prevalence of 16.5% for any mood, anxiety or substance use disorder (Williams *et al*. 2008). Pregnancy is often the time most women find out about their HIV status. This may have a significant impact on a woman's mental health. During pregnancy, HIV women may be initiated on to HIV treatment programmes.

Depression is associated with lowered adherence to antiretroviral medication and poor use of antenatal care (Rochat *et al*. 2006, Meade and Sikkema 2005). Mental illness is also a significant factor in AIDS-related mortality among women (Cook *et al*. 2004). Local research has shown that women with HIV are more likely to experience abuse, and those that are abused are more likely to contract HIV (Dunkle *et al*. 2004).

South Africa exhibits one of the highest rates of gender-based violence in the world (Jewkes *et al*. 2009, Stein *et al*. 2008, UNIFEM 2006, WHO 2009). In addition, abuse and violence increase during pregnancy, with the severity increasing as the pregnancy progresses (Dunkle *et al*. 2004). Abuse during pregnancy contributes to the high prevalence of unwanted pregnancy, pregnancy complications and miscarriages. Mental health sequelae of gender-based violence include: substance misuse and common mental disorders, such as post-traumatic stress disorder, depression, and suicidality. PMHP data shows that women who experience domestic violence are at a 24 times greater risk of qualifying for referral to a counsellor on the basis of mental health screening (n = 1 008, OR 24, CI 8.86-67.17, $p < 0.001$)

It has been shown that mental health support for HIV-positive mothers is vital for the general

health of the woman, the baby and the rest of the family (WHO 2008). Similarly, treating mental illness has been identified as an important intervention toward mitigating the consequences of abuse (Dunkle *et al*. 2004, Kopelman *et al*. 2008). Thus, several key vulnerabilities in women and their children may be addressed by making the perinatal period the point of entry to mental health services.

Conclusion

The costs of failing to address perinatal mental health issues may be felt over generations. Yet, maternal mental health interventions have been shown to significantly reduce healthcare costs in developed and developing countries (Black *et al*. 2009, Patel and Prince 2006, Rahman *et al*. 2007).

A significant body of evidence demonstrates the potential benefits for mother and child of integrating a maternal mental health framework into the primary care setting (Araya *et al*. 2003, Price and Proctor 2009, Patel *et al*. 2003, Rahman and Creed 2007). The PMHP experience shows a high level of need for maternal mental health services, while also demonstrating the feasibility of an integrated intervention in the local setting. Integrated maternal mental healthcare offers an important opportunity to promote the well-being of mothers and children.

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