

A BROAD LITERATURE OVERVIEW OF HIV PREVENTION OF MOTHER TO CHILD TRANSMISSION: MALE INCLUSION

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Abstract

The paper offers a comprehensive review of the current discourse on the prevention of mother to child infection in HIV/AIDS. Within this, a special focus is given to South Africa and modifiable challenges to the effective implementation of programs of prevention are offered. The review affirms the lack of agreement within previous research about the range of consistent barriers to implementation and equally importantly, the range of interventions that can be effected to improve engagement in prevention programmes.

The paper also presents a literature review, which focuses much more specifically on related literary sources that look at the factors that play an important part in determining patterns of PMTCT service uptake. As acknowledged earlier, research on the uptake of PMTCT confirms that usage remains unexplainably low and more notably, the South African picture is characterised by less success than is acceptable. One of the key issues of concern has been the limited involvement that male partners have had with regard to PMTCT service usage even in the face of research that shows that spousal involvement and/or the involvement of partners offers noteworthy potential in motivating affected pregnant women to take up PMTCT services. To foreground this noted knowledge-gap, the current review of literature aims to provide a comprehensive overview of current viewpoints and existing research evidence, to determine prominent viewpoints in the study area.

In addition to the synthesis function, the review was concerned with drawing attention to the range of previously published challenges that exist when implementing PMTCT.

Introduction

Chapter one presented the background to the study and the range of theoretical perspectives that set the basis for the study of PMTCT and in particular issues related to male involvement and its impact on service-uptake. This chapter presents a literature review, which focuses much more specifically on related literary sources that look at the factors that play an important part in determining patterns of PMTCT service uptake. As acknowledged earlier, research on the uptake of PMTCT confirms that usage remains unexplainably low and more notably, the South African picture is characterised by less success than is acceptable. One of the key issues of concern has been the limited involvement that male partners have had with regard to PMTCT service usage even in the face of research that shows that spousal involvement and/or the involvement of partners offers noteworthy potential in motivating affected pregnant women to take up PMTCT services. To foreground this noted knowledge-gap, the current review of literature aims to provide a comprehensive overview of current viewpoints and existing research evidence, to determine prominent viewpoints in the study area. The University of York's NHS Centre for Reviews and Dissemination offer a definition of literature reviews and view them as being about, "...locating, isolating, appraising and synthesising evidence...from studies in order to obtain a reliable overview". (University of York NHS Centre for Reviews and Dissemination, 2005).

In addition to the synthesis function, the review was concerned with drawing attention to the range of previously published challenges that exist when implementing PMTCT.

In other words, the purpose of a literature review is to demonstrate to the reader that one has a good grasp of the main published work concerning a particular topic or question in the identified field. According to Shields and Rangarajan (2013), the review should not just be a description of what other people have published but a critical discussion that presents insight and an awareness of the different arguments, approaches and theories. In achieving this, a systematic approach was utilised in line with guidance suggested by Parahoo (2006).

Format of review

This review is based on the Framework and model proposed by Crombie (2003) and will include a number of key sections such as an overview of a data search strategy, a tabular summary of reviewed sources and the review proper of related literary sources. The presentation of literature will be under thematic headings related to the study of PMTCT usage, as a means of facilitating a more meaningful appraisal of literature that focus on the challenges and barriers to the uptake of PMTCT services. Before the formal review of literature, an introductory section will be presented in which prevalence issues related to mother-to-child infection in HIV/AIDS is discussed.

Data search strategy

Initially the University library was used to search for books and journals that related to the topics of PMTCT service uptake and general involvement and uptake of sexual health services. The use of libraries is seen as an excellent starting point as it allows the gathering of information and access to alternative sources Petre and Rugg (2010). Simultaneously, the use of electronic databases was also used to offer a wider range of literature. Wentz (2014) emphasise the importance of the reviewer possessing the skills necessary to perform a comprehensive search of the available literature and to this end, private effort was given to gain familiarity with a range of health related databases.

Before engaging in the searches, a set of keywords was decided upon. In order to assemble the group of keywords that would be used in the search, a mind map was drawn so that core elements and arguments could be highlighted. D'Antonia (2009) and Beel and Langer (2011) emphasise the use of a mind map to guide an initial understanding of the topic.

The creation of a mind map to aid in the formulation of keywords helped to identify key search terms. Identifying keywords for the subject before initiating any literature search would ensure that correct results are obtained. In contrast, any omission of keywords may result in an incomplete and unfocussed search (Burns and Grove, 2005).

The following keywords and phrases were used:

1. Engagement or uptake or usage of sexual health services.
2. Engagement or uptake or usage of HIV/AIDS services.
3. Factors related to the uptake of primary health care.
4. Factors related to the uptake / usage of PMTCT.
5. Challenges / Barriers with implementing PMTCT.
6. Male involvement in sexual health services.
7. Involvement in HIV/AIDS services.
8. Prevention of mother to child infections in HIV/AIDS.
9. Cultural factors related to health and social care service usage.
10. PMTCT and South Africa.
11. Problems / challenges with PMTCT delivery.

Each of the search terms were initially used individually, and then combined using Boolean operators AND, and OR. The use of Boolean operators allows a wider exploratory search of the literature (Wood, 1999).

The resources that were available for the literature search were books and journals, which included both hardcopy and electronic databases. The initial hard-copy library search did not reveal many current sources, and therefore, primary focus was on searching various electronic databases as summarised below: -

1. Unabridged Medline (Jan1976-May 2013).
2. CINAHL- The Cumulative Index of Nursing & Allied Health Literature (Feb 1965-2013).
3. OVID – an online database that searches across several medical and nursing online sources (1984 – 2013).

4. EBSCO-host search engine (1980 – 2013)
5. Cochrane Database of Systematic Reviews (1996-2013).
6. A hand-search of local South African Journals at the Local Health Authority library.

The University of South Africa's (UNISA's) vast array of library resources (including databases) were optimally utilised for local and international input through the ILL (inter-library loan) system. The latter enabled the researcher to obtain documentary and electronic information and data that are only available at other academic institutions and organisations to which the UNISA library is affiliated. The archives, databases and websites of other local and international sources of information, such as reputable research institutions and organisations (e.g. the Human Sciences Research Council (HSRC), the Health Professions Council of South Africa (HPCSA), and DENOSA (Democratic Nursing Organisation of South Africa, Stats SA (Statistics South Africa), the International Council of Nursing (ICN), and the World Health Organisation (WHO) were consulted in the quest of obtaining a multi-perspective approach to the research topic.

Criteria for inclusion and exclusion

The initial search, using each of the primary search terms independently, identified over four hundred potential sources. However, the inclusion of other parameters, such as 'primary research' and 'English', led to an enormous reduction in the potential references of interest to 64. It is critical to highlight that not all of the 64 identified references were found to be relevant to the review question. This conclusion was reached when detailed inclusion and exclusion criteria, listed below, were applied to the literature or studies obtained for review. Inclusion criteria:

1. Studies that focussed on implementation issues related to PMTCT services.
2. Studies that focus on HIV/AIDS services' usage issues, in particular the involvement of men in sexual health and PMTCT services.
3. Studies/literature focusing on the usage of sexual health services and/or preventative services in sexual health.
4. Studies published in English.
5. Given the difficulties that exist in authenticating data from the worldwide web (internet), only literature from validated academic databases such as OVID via Athens and CINAHL were considered for inclusion within the review.

Furthermore, the reviewer, as a means of validating their existence, manually sourced hard copy paper versions of studies retrieved from Internet sources.

The following Exclusion criteria were applied to literary sources:

1. Studies whose academic credibility could not be authenticated.
2. Studies written in languages other than English.
3. Studies published before 1980. This is largely because the theoretical positions related to sexual health issues have changed significantly in recent years and studies older than 1980 are likely to have limited direct relevance to the current study.
4. After applying each of the above criteria, only 32 literary sources (23 of which were original research) met the strict criteria for inclusion, and also satisfied the academic and scientific rigour expectations for inclusion in the review. The primary research studies that fully satisfied the inclusion criteria are reviewed in the following chapter.

Appraisal of identified studies for the literature review

Table 2.5 below offers a summary of each of the primary research studies included within this literature review. Once identified for inclusion within the review, the process of reviewing each study was based on established and validated models of critical appraisal, such as those offered by Saks and Allsop (2013) and Gazzard (2011). The decision to use a combination of frameworks is in keeping with guidance from Silverman (2004). He stipulated that different, or a mixture of appraisal frameworks, must be used for appraising qualitative and quantitative research sources, as these literature sources are inherently different in terms of the quality of evidence they can offer. Although not wholly similar, each of these appraisal frameworks focuses on exploring a combination of methodological issues and the contribution each literary source made to the body of knowledge. In essence, the review of individual studies was weighted on the knowledge-contribution made to the current understanding of PHC and implementation issues related to this area of health care. To be more specific, the studies were evaluated in

terms of their rigour, validity, reliability, dependability and transferability to the practice context (Polit and Beck, 2008). Additional factors explored within the review process included the researcher(s) apparent clarity in their formulation of the study question(s), whether or not the methods of data collection adopted were scientifically sound and appropriate to the issue under investigation. Further attention was given to the handling of data within each of the reviewed sources, including how well researchers addressed potential limitations of their studies.

Table 1.1. - Summary of primary research work reviewed.

Author/Date	Title of paper/Aim of study	Key Findings
Akpabio, Asuzu, Fajemilehih & Ofi, 2009	<i>Effects of School Health nursing education interventions on HIV/AIDS related attitudes of students in Akwalbon State, Nigeria</i>	Results show significant effect of intervention on students' attitudes toward preventive measures. The intervention that involves nurses only was found to be a more potent strategy in providing favorable attitudes toward HIV/AIDS prevention. Attitudes were influenced by older age but not by gender.
Akarro, Deonisia & Sichoma, 2011	<i>An evaluation of male involvement on the program for PMTCT of HIV/AIDS: A case study LLala municipality on Dar es Salaam, Tanzania</i>	The study revealed that communication barriers between pregnant women and their husband/partners are the limiting factors of follow up to uptake and utilisation of PMTCT services. Logistic Regression Analysis shows that all the limiting factors of knowledge, attitude, and communication behaviors among partners have had a greater chance of influencing a follow up to the uptake of PMTCT services.
Author/Date	Title of paper/Aim of study	Key Findings
Doherty, Sanders, Goga & Jackson, 2010	Implementation of the new WHO guidelines on HIV and infant feeding for child survival in South Africa	The study recommendations were based on programmatic evidence and research studies that have accumulated over the past few years within African countries. The paper urges national or sub national health authorities to decide whether health services should mainly counsel and support HIV infected mothers to breastfeed and receive antiretroviral interventions or to avoid all breastfeeding.
Kunene & Kekana, 2009	<i>Midwives' Perspectives on HIV/AIDS care in maternal health services</i>	Results showed that 70% of respondents had received training on the dual-therapy regime for prevention of mother-to-child transmission (PMTCT) and 52% had received training on antiretrovirals (ARVs). Most, however, also felt they needed more training.
Author/Date	Title of paper/Aim of study.	Key Findings
Stringer, Chi, Chintu, Creek, Ekouevi et al, 2008	<i>Monitoring effectiveness of programmes to prevent mother-to-child HIV transmission in lower-income countries</i>	Ambitious goals for paediatric AIDS control have been set by various international bodies, including a 50% reduction in new paediatric infections by 2010. While these goals are clearly appropriate in their scope, the lack of clarity and consensus around how to monitor the effectiveness of programmes to prevent mother-to-child HIV

		transmission makes it difficult for policy-makers to mount a coordinated response.
Sheahan, 2010	<i>Preventing the preventable: An analysis of CRC concluding observation on the right of survival</i>	The focus of the study is specifically on the right to survival from the perspective of the right to health and the right to non-discrimination. Governments obliged to ensure to the maximum extent possible survival and development of the child; diminish infant and child mortality and to guarantee every child the highest attainable standard of health and include a positive obligation to ensure children's right to survival free from discrimination. Although child survival is often discussed as a case of political will, state action and the allocation of maximum available resources is actually a legal obligation in all these countries.
Author/Date	Title of paper/Aim of study.	Key Findings
Skinner, Mfecane, Gumede, Hendsa, & David, 2005	<i>Barriers of accessing PMTCT Services in rural area of South Africa. African Journal of AIDS Research</i>	Identified poor resourced areas as having difficulties in implementing PMTCT due to poor infrastructure. PMTCT has been introduced to understaffed and over pressured personnel which makes it even more difficult to implement.
Tint, Doherty, Nkonki, Witten & Chopra, 2003	An education of PMTCT and infant feeding training in seven provinces of South Africa	The evaluation reviewed the training model of the National Department of Health to determine its appropriateness for addressing the provincial training needs in the context of the necessary rapid scaling up of PMTCT services. It also explored the training strategy used in the provinces with regard to aspects of sustainability for future capacity development. The short term impact of the training was assessed to determine whether it responded to the new demands of the PMTCT programme in terms of knowledge, confidence in counselling skills and providing PMTCT care and infant feeding options to pregnant women.
Author/Date	Title of paper/Aim of study.	Key Findings
Sherman, Jones, Coovadia, Urban & Bolton, 2004	<i>PMTCT from research to reality- results from a routine service</i>	The study assessed the efficacy of a prevention of mother to child transmission programme in a routine service setting in comparison to a research environment. Of the 8221 deliveries, 1234 (15%) occurred in women known to be HIV positive. HIV transmission rates of 8.7% at 6 weeks and 8.9% at 3 months of age in the study population verifies the high rate of NVP administration and ability of women to formula feed their babies and abstain from breastfeeding. More than one third of infants never return for follow up and more than 70% are lost to follow-up by 4 months of age. The low HIV transmission rate confirms the efficacy of

		this routine service PMTCT programme. HIV infected children are not being identified for medical management as part of PMTCT follow-up. It is imperative that record keeping is improved to facilitate ongoing monitoring.
Author/Date	Title of paper/Aim of study.	Key Findings
Mohat & Eller, 2009	<i>HIV/AIDS and Universal precautions : knowledge and attitudes of Nepalese nursing students</i>	Nepalese nursing students have a large knowledge gap and negative attitudes, regardless of level of education. Their HIV/AIDS knowledge differed statistically significantly by group but there were no statistically significant group differences in general attitudes towards HIV/AIDS. Although knowledge of universal precaution improved with year of education, overall universal precautions knowledge was poor among all students, regardless of education. Nursing curricula must include adequate and culturally relevant content on HIV/AIDS, attitudes towards people living with AIDS, and universal precautions.
Pickles, King & Belan, 2011	<i>Undergraduate nursing student's attitudes towards caring for people with HIV/AIDS.</i>	The aim of this study was to determine the attitudes of Australian nursing students towards caring for people with HIV/AIDS. This research study was conducted among second year undergraduate nursing students at a university of South Australia, during August 2007. The questionnaire was completed by 396 students, giving a response rate of 94.7%. the vast majority of students participating in the study demonstrated very positive attitudes towards caring for people with HIV/AIDS and only 4.3% demonstrated negative attitudes.
Author/Date	Title of paper/Aim of study.	Key Findings
William, Wang, Burgess, Chenghuaie, Gong et al, 2004	Effectiveness of an HIV/AIDS educational program for Chinese nurses	At baseline, HIV/AIDS knowledge was not high and attitudes and willingness to care were neutral, knowledge, attitudes toward patients with HIV/AIDS and willingness to provide nursing care to these patients were each improved.

Before engaging in a full review of literature related to research on the prevention of mother to child infection, it was important to offer a brief review of global prevalence and incidence. This offers an important opportunity to draw attention to the significance of the problem and importantly, it reemphasises the uniquely high rates of infection in South Africa.

Statistical background to HIV/Aids prevention and mother to child prevention

The World Health Organisation (WHO, 2011) estimates 50% worldwide HIV population composed of females and were increasing in numbers. Women are more vulnerable to HIV/AIDS and in most cases it is due to socio-economic dynamics ranging from gender inequalities, poor economic status, illiteracy, domestic and sexual violence and many more.

The Republic of South Africa (RSA) like all other developing countries is badly affected by HIV/AIDS. Approximately 3, 5 million persons are thought to be living with the virus or disease. HIV/AIDS is presently a leading cause of death in RSA (Republic of South Africa) (WHO, 2010). Approximately one million children will have lost their parents to the disease by 2005 with 25% of their population expected to be HIV/AIDS positive by 2010. The epidemic severely affects the young black and economically poor populations in RSA (WHO, 2010). Given facts on escalating figures of new HIV/AIDS prevalence and life expectancy of 60 to 40 years between 1998 and 2008 (WHO, 2010), PMTCT programme was necessary to ensure an AIDS-free generation in the year 2010 (WHO, 2008).

There is insufficient information to explain the escalating figures of children and maternal deaths and as such, there is much work needed to ensure the achievement of the targets related to the millennium developmental goal number four, that of saving mothers and children (Kunene & Kekana, 2009). Infant and maternal mortality remains a global burden irrespective of enormous scientific work done. Sheahan (2010) and WHO (2000) believe that every year, millions of children die from treatable and preventable diseases like HIV/AIDS. WHO (2000) reported millions of maternal deaths worldwide and 98% of such deaths occur in developing countries like the Republic of South Africa (RSA).

The South African Government has made a huge commitment of reducing child mortality by two-thirds in response to the Millennium Developmental Goals (MDG) which is MDG4, that of saving mothers and children (Kunene & Kekana, 2009). The health status of a mother and child has been given attention over the years but RSA remains one of the 12 countries in the world that still has an increase of maternal and children mortalities since 1990 (Kunene & Kekana 2009; Horwood, Haskins, Versmaak, Phakathi, Subbaye & Doherty, 2010).

The majority of the estimated 35 million people with HIV live in Sub-Saharan Africa, where 70% of all new infections occur. Women represent over 60% of all infections. Southern Africa with the highest regional prevalence reflects different phases of the epidemic. Zimbabwe alone has a prevalence of 14.3%, the epidemic began early, peaked in 1998 with a subsequent decline in incidence and prevalence. RSA on the other side has a provincial prevalence ranging from 5.3% to 25%, Gauteng at 20.3% and declined in 2008 to 15.2%, KZN rose from 15.7% in 2002 to 25.8% in 2008. KZN appears to be the worst hit province with high HIV/AIDS prevalence (HST, 2011).

The epidemic of HIV/AIDS remains a global burden and South Africa being a developing country is suffering the hardest hit and is far from reaching its goal of treating 50% of those in need of therapy by 2011 (Kunene & Kekana, 2009). In response to RSA mothers and children, RSA adopted and implemented the prevention of mother-to-child transmission programme (PMTCT) in 2001 with a hope to improve the quality of life (DOH, 2008). HIV/AIDS in RSA remains uncontrollable and it is a huge health burden (Kunene & Kekana, 2009).

Historical development of PMTCT

The prevention of mother-to-child transmission (PMTCT) programme dates back to the year 2000 (when it was first recommended by WHO in the year 2000 and no country had used anti-retroviral agents in pregnancy before) and was declared in 2001 in the United General Assembly special session on HIV/AIDS. The members committed themselves to reduce HIV infections by 50% by the year 2010 (WHO, 2007), five years later post international PMTCT inception, the programme was grossly criticised by most researchers (Chopra & Rollins, 2008; BHITS, 2004). To have neglected the controversy and confusion concerning optimal infant breastfeeding and most health personnel were in a dilemma with little knowledge of how to assist mothers in making informed decisions on a feeding method, where reports showed that the HIV/AIDS epidemic among pregnant women has reduced support for breastfeeding interventions in African States and has resulted in a reduction in breastfeeding rates amongst women not known to be HIV positive at PMTCT sites.

A study conducted by Doherty, Sanders, Goga, and Jacksom (2010) concluded that the DOH (2010) promotion of exclusive breastfeeding for six months is an informed and scientific decision that ought to be adopted by the global health communities to maximise child survival and not only the avoidance of HIV transmission. The WHO (2009), defines breastfeeding as healthy, which creates a strong child's immunity against disease and prescribes that health care workers must assess an individual mother and recommend breastfeeding on the following basis; being acceptable, feasible, affordable, sustainable and safe (WHO, 2009; DOH, 2010; Doherty et al, 2010).

Thus Chopra & Rollins (2008) concluded that there were significant shortcomings in even the most basic knowledge of HIV transmission through breastfeeding amongst health workers and community members in spite of training and counselling of HIV positive mothers concerning infant feeding. It was felt that the options were too brief, and only

focussed on one type of infant feeding option and rarely extended to supporting practices after childbirth. The South African PMTCT programme was also criticised by WHO (2008), having failed to prevent drug resistance of nevirapine, hence a new document on PMTCT was published and the programme was revised in RSA with a new regimen introduced correcting identified errors (DOH, 2010).

In response to the breastfeeding controversy, Sedibe & Goosby (2011) published a comprehensive plan of HIV elimination in the global community, the infections among children and keeping their mothers alive. The planned focus is on reaching pregnant women living with HIV, and their children, from the time of their pregnancy until the mother stops breastfeeding. Prior to pregnancy, and after breastfeeding ends, HIV prevention and treatment needs of mothers and children will be met within the existing continuum of comprehensive programmes to provide HIV prevention, treatment, care and support for all who need it.

PMTCT implementation: an overview of challenges

PMTCT is a global effort to reduce HIV among children, and WHO facilitate the elimination of mother-to-child transmission of HIV, by advocating for all international HIV positive pregnant mothers who meet set pre-requisites to be commenced on ant-retroviral agents. Early PMTCT studies were done in well-developed European countries like the United States of America (USA), women in these countries have good prenatal and delivery care ranging from laboratory testing, and breastfeeding options. Whereas the situation in most developing countries like Zimbabwe, RSA and other African countries differs dramatically (Stringer, Benjamin, Chintu, Creek, Ekouevi et al 2008). African states were struggling to have all PMTCT related services up and fully functional, services like laboratory testing, community awareness campaigns, proper funding of PMTCT institutions, elective caesarean sections. Worse still to inconvenience pregnant women to utilise limited available antenatal, perinatal and post-partum services. The PMTCT suffered a lot of teething challenges like all other programmes and it is very disappointing to learn that even after 10 years of global PMTCT, that children still get infected by HIV/AIDS and mortality rates remain high (Stringer, Chintu, Creek, Ekouevi et al, 2008).

The world community needed PMTCT programmes to ensure children's survival, even Zimbabwe in 2004, was evidently mobilised towards a meaningful PMTCT implementation (Perez, Orne-Glieman, Mukotekwa, Miller, Glenshaw et al, 2004). The PMTCT inception in 2000 ensured the WHO's strength of improving quality of life for HIV positive pregnant mothers and continues to strive for a HIV free generation with no vertical transmission which is in line with the millennium developmental goal adopted by international countries including RSA, that of saving mothers and children (WHO, 2007). Researchers are still struggling to detect the most suitable monitoring tool for the PMTCT programme, several meeting in line to improve treatment regimen to avoid adverse reactions during and after pregnancy, and global countries have been called by the WHO to make visible efforts to eliminate vertical transmission (WHO, 2010). WHO (2010) is working tirelessly in collaboration with UNICEF, UNFPA and UNAIDS to ensure technical consultation and proper implementation of PMTCT as high fatalism was estimated before a child could reach a second birthday with HIV infection.

Nevarapine had been effective and widely used in PMTCT as early as 1999 by the global community and it was indeed cost effective even within developing countries like RSA. In the early implementation process of PMTCT around 2002, RSA used district hospitals as sites for the pilot study. The focus was on Ante-Natal Care (ANC), as mothers did not feel the need for a hospital based delivery but were willing to attend ANC (Nuwagada et al, 2007; UNAIDS, 2010).

The Western Cape Province in RSA, as early as 2002 had an effective PMTCT programme and set good precedence for the country and continent. By the year 2002, Western Cape pregnant mothers (60%) were attending public sector maternity services and PMTCT had already commenced. It was believed that by June 2002, they would have reached 90% and hoped for universal coverage by March 2003 (Western Cape Health, 2002) while implementation of PMTCT in the Eastern Cape was a major struggle due to poor infrastructure and poor clinic attendance, poor sanitation exposed children on milk formula to greater risks of infections (Skinner, Mfecane, Gumede, Hendsa, & David, 2005).

Most developing and developed countries were concerned with the increasing numbers of HIV positive clients. Uganda started to intensify its PMTCT programmes, pregnant ladies were offered HIV/AIDS testing, counselling and if positive offered a single dose of nevarapine at the onset of labour but only a minority received **Highly active antiretroviral therapy** (HAART). PMTCT modified all care rendered to HIV positive women, even staff attitudes had to be transformed to cater for both mothers and babies as per Millennium Developmental Goals, modified

intrapartum obstetric care, vaginal cleansing, delaying rupture of membranes in labour, limiting number of episiotomies and delivery by caesarean section in exceptional circumstances only (Uganda Health Ministry, 2001). PMTCT is a comprehensive programme with independent functions, even neonates born from an infected mother were to be given Nevirapine or Zidovudine for a week after delivery, and a rapid HIV test done at 3 and 6 months, or 18 months if still breastfeeding (Nuwagaba et al, 2007).

A fully functional PMTCT programme requires collaborated efforts from government, non-governmental organisations, parastatals, politicians, and even religious organisations (WHO, 2011). WHO (2007) believes that PMTCT is an integrated approach that requires collaborated efforts from all stake holders for effective and efficient service delivery. UNESCO (2011) shares the sentiment that PMTCT and (Anti-retroviral) ARV treatment must be scaled up, and share a unique similarity of programmatic, logistical, resources mobilisation and community needs. The integration approach of PMTCT has different levels of implementation and must be well co-ordinated for a positive outcome of PMTCT programmes, levels range from policy development, planning, management and co-ordination, service delivery, community mobilisation and patient follow up for effective adherence (WHO, 2007). All stakeholders in PMTCT programmes are important and have interdependent roles that are, supply management, monitoring and evaluation components, budgets, and partners' roles and responsibilities; all efforts are geared towards a HIV free generation, and improvement of quality of life for HIV pregnant women and their children.

Horwood et al (2010) are of the view that the complexity of PMTCT programmes require that PMTCT activities be carried out by several workers at different times and in different settings. Horwood et al (2010) cited Gold et al 2007 who believed that to achieve comprehensive implementation, it is critically necessary that HIV infected women and their babies are identified at every contact with the health service and that all steps in the PMTCT process are fully implemented. The overall effectiveness of PMTCT depends on HIV positive pregnant women with low CD4 count, being identified, with the initiation of highly active antiretroviral treatment (HAART) before delivery, in this high risk group. Accurate record keeping and continuity of care is required, and any break in the chain of activities will lead to a reduction in the expected benefits of the programme for both mother and infant.

PMTCT in Zimbabwe was implemented at a decimally slow rate, pregnant women continued to suffer and little was done by the government to assist. In 2001, only 4% of women and children in need of PMTCT services were receiving them (Perez, Orne-Gliemann, Mukotekwa, Miller, Glenshaw et al, 2004). In a study conducted in Zimbabwe in 2001, 326 of 437 tested HIV positive and only 104 women received nevirapine prophylaxis which exposed 222 innocent infants to HIV/AIDS in Zimbabwe (Perez et al 2001:1139). A study conducted in RSA on PMTCT implementation revealed that PMTCT coverage in South Africa is feasible, however very high rates of loss to follow up have been observed especially for HIV exposed children (Coetzee, Hilderbrand, Boull, Draper, Abdullah & Goemaere, 2005; Jackson, Chopra, Doherty, Colvin, Willumsen et al 2005). A PMTCT study conducted in KZN in 2005 indicated that PMTCT programme had little impact on transmission rates (Rollins, Little, Mzolo, Horwood, & Newel, 2007), as mothers were fearful to test, fearing victimisation by relatives if found to be HIV positive, and mothers were not even keen to care for infants that were HIV exposed. Horwood et al (2010) believe that improving integration of PMTCT services into routine care is critical to improve access to these services. The PMTCT coverage in KZN is evident during pregnancy and delivery. 97.3% females were tested in their pregnancy and CD4 counts were done and recorded, clinics had dedicated PMTCT nurses in a study conducted in KZN in 2010 evaluating coverage of PMTCT programme in Amajuba and UThukela districts. The study did not focus on each talk and treatment given to clients to prevent MTCT and strategies of follow up care are not clear.

Proper implementation of PMTCT is extremely important, it can save lives and innocent infants and channel infected mothers appropriately to HAART thus improving the quality of life for those with HIV/AIDS. According to a surveillance study conducted by Rollins, Little, Mzolo, Horwood and Newel (2007), PMTCT programme fails to quantify numbers of infected infants due to poor postnatal follow up.

The WHO (2007), assessed and to save children from vertical transmission acknowledged HIV as a global burden to both children and women and acted accordingly. PMTCT programme was invented and the WHO (2007) revealed shocking HIV statistics, stating that 39.5 million people were living with HIV/AIDS, including an estimated 17.7 million women. Women had the fastest rate of increase of HIV with a lead in Sub-Saharan Africa (by 2005, 540.000 children were reported as new infections, 90% of those children were from Sub-Saharan Africa).

Kunene & Kekana (2009) rated RSA as one of the 12 countries with escalating figures of new HIV infections; other countries with high rates included, Zimbabwe, Uganda, Tanzania, Nigeria, Congo, Kenya, Mozambique, India, and

Ethiopia. The HIV prevalence amongst mothers and children in the year 2000 compelled implementation of new strategies such as PMTCT, the new infections at that time amounted to 60% amongst women, infants and young children (under the age of 15) at a rate of 1400 per day.

Children are at risk of contracting HIV from their mothers during pregnancy, birth and through breastfeeding (WHO, 2007). RSA is in most need for vibrant and well monitored PMTCT programme as statistics show that it has 29% of HIV positive women and 37% of such HIV positive women are in KwaZulu Natal (Kunene & Kekana, 2009). WHO (2007) reported more than 10% of global new HIV infections were related to vertical transmission and formulated 90% in infants and young children. The PMTCT regimens have been revised regularly ever since the beginning to ensure efficacy and more studies are conducted to ensure a HIV free generation through the PMTCT programme (WHO, 2007; DOH, 2010).

The PMTCT programme has been developing since its inception in the year 2002 in RSA (Kunene & Kekana, 2009). Research has influenced South African PMTCT into various directions in the hope of improving maternal and child welfare (DOH, 2010). According to Sherman et al (2004), RSA implemented PMTCT in July 2002 when a Constitutional Court judgement ordered the DOH to make NVP universally available to HIV infected pregnant mothers. The NVP efficacy was therefore left open for health researchers to study and evaluate, hence a series of studies followed and more agents were added in 2010 such as AZT and Truvada to prevent drug resistance (DOH, 2010). Honourable President Jacob Zuma in 2009 on a world AIDS day announced improved HIV/AIDS management adjustments and new interventions to improve access to ARV for priority groups in order to decrease the HIV/AIDS burden and to address maternal and child mortality, and to improve life expectancy (DOH, 2010). The South African HIV/AIDS protocols and procedures to ART were adjusted accordingly; hence WHO (2011) reported increased figures of people on antiretroviral treatment (ART) even in low and middle income countries, figures had reached 7.4 million by 2010, a more than 16 fold increase in seven years which represents 47% coverage of those in need of ART, while 63% are still without help and shall continue to infect others and die of AIDS.

Factors that support PMTCT intervention: HIV/AIDS in pregnancy

HIV (Human Immune Deficiency) infects cells of the immune system, destroying cells of the immune system impairing their function. In pregnancy, HIV progresses faster and the immune system becomes weaker and the person becomes more prone to disease, leading to the advanced stage of HIV infection known as AIDS (Acquired immunodeficiency syndrome). Usually it takes 10-15 years for an infected person to develop AIDS; ARTs can slow down the process even further prolonging the mother's life span and protecting/saving children from MTCT (WHO, 2011).

According to Flisher (2012), pregnancy means production and a new member of the family while other mothers view pregnancy as the beginning of a life-time of new challenges. 84% of pregnancies in RSA come with HIV infection. Sero-conversion brings enormous depression and anxiety, affecting the immune system's ability to fight new infections, depressed mothers have shown increased vulnerability to opportunistic infectious diseases. HIV/AIDS in pregnancy makes women more prone to re-infections, many do not have the strength to demand safer sex and women feel helpless. HIV infection is a major cause of mental illness, almost (43.7%) of all people living with HIV/AIDS in RSA will experience a mental illness. It is often made worse during pregnancy as it makes pregnant women more prone to post-partum psychosis (Flisher, 2012).

Pregnancy does not always bring joyful moments, health science studies indicate that 52% of pregnant women worldwide do not have a say with regard to sexual practices (Elizabeth Glaser paediatric AIDS foundation, 2010). Women are often sexually abused and exposed to HIV against their will, the men involved have HIV and they spread it intentionally. Abused women are often reluctant to participate in PMTCT programmes due to fear of disclosure and further abuse by partners if tested positive (Elizabeth Glaser paediatric AIDS foundation, 2010). All reasons for not testing expose innocent children to HIV/AIDS and access to preventive measures like PMTCT is delayed. Tanzanian pregnant women (52%) refused testing and stated that they were not ready to disclose their status and they feared their partners' reaction; even exclusive breastfeeding brings suspicion among in-laws, thus victimising a HIV positive woman.

Studies show that men can be violent when females disclose their HIV status during pregnancy. In Tanzania in 2004, 14.6% reported gender based violence when disclosing a HIV positive diagnosis bringing about violence, abandonment and stigma (Elizabeth Glaser paediatric AIDS Foundation, 2010).

The 22 countries with 90% of pregnant women living HIV are: Angola, Botswana, Burundi, Cameroon, Chad, Ivory Coast, Congo, Ethiopia, Ghana, India, Kenya, Lesotho, Malawi, Mozambique, Namibia, Nigeria, South Africa, Swaziland, Uganda, Tanzania, Zambia, and Zimbabwe. They are in need of PMTCT programmes in order to save mothers and children (UNAIDS 2011:2). Globally, 42 000 – 60 000 pregnant women died because of HIV (Sedibe & Goosby, 2011).

Haiti has fewer burdens of HIV/AIDS compared to RSA. Haiti reported a population of 2.2% with HIV/AIDS which is approximately 10,100 people living with HIV/AIDS on ARTS. However, the country as a whole has its own challenges, like shortage of health professionals and nurses who are expected to take a leading role in primary health care, prevention of HIV/AIDS, care and treatment (Knebel, Prismsy, Deverois, Meejour, Lemaire et al, 2008).

Despite PMTCT's improved interventions, HIV/AIDS in pregnancy remains a global crisis and an arena for improved methods of comprehensive management of HIV/AIDS. WHO (2008) estimated alarming figures of 50% of HIV positive women being pregnant internationally. In Sub-Saharan Africa, women constitute 60% of people living with HIV (WHO, 2008). HIV/AIDS in Zimbabwe is a daily reality, women are suffering the hardest hit as a study conducted in both urban and rural Zimbabwe by Perez et al (2004) indicated that 90% of 800 000 children infected by HIV were born to infected women and acquired the virus during pregnancy, labour and delivery and even through breastfeeding in mixed-feeding methods.

Zimbabwe has the highest rates of HIV infection in the world, with an average ANC (Ante Natal Care) HIV prevalence of 25% (21% in urban areas and 28.1% in rural areas) in 2003. The Republic of South Africa is a developing country that has both developed and developing country challenges, and appears to be suffering high rates of HIV/AIDS among women. Kunene and Kekana (2009) state that RSA has 29% of HIV positive pregnant women and KwaZulu-Natal as having 37% of HIV positive mothers. Globally, 800 000 children are born to HIV positive mothers; they acquire HIV either during pregnancy, delivery or through breastfeeding (DOH, 2010; WHO, 2008; Kunene & Kekana, 2009).

According to WHO (2008), HIV/AIDS among pregnant women has been influenced by many factors, ranging from bisexual orientation among men who prefer sexual encounters with both females and males, prostitution which puts sex workers and their clients at high risk of contracting HIV/AIDS, in some settings, this contributes to higher infection rates among young women (15-24 years) compared to young men of heterosexual orientation, younger homosexuals are at a greater risk of contracting HIV/AIDS from bisexuals thus increasing the risk for women engaging in sexual practices with bisexuals. Cultural and traditional beliefs play a part where gender inequality recognises masculinity as superior above feminine and sexual assaults are on the increase.. Statistics from (WHO, 2008), reveal that women between 10% - 60% (ages of 15–49) worldwide are vulnerable to HIV/AIDS during sexual assaults; other predisposing factors to HIV/AIDS in pregnancy range from social insecurities, social grants (poverty), orphanhood (children seeking love in sexual practices), women who fear or experience violence lack the power to ask their partners to use condoms or refuse protected sex. Fear of violence can prevent women from learning and or sharing their HIV status with partners or families and this delays them from accessing treatment programmes such as PMTCT and HAART (highly active on anti-retroviral treatment).

HIV/AIDS in RSA is vigorous, all age groups are affected and infected, the AIDS epidemic is reflected in the dramatic change in RSA's mortality rates. According to Minnie, Klopper and Walt (2011), 29,4% of RSA pregnant women are HIV positive and most are identified during ANC when HIV/AIDS testing is routinely done. The identified women are given ART. Coverage is higher in women; women receive 53% while males on an international level get 40% (WHO, 2011).

KwaZulu Natal in RSA remains a troublesome province with persistent and escalating figures of HIV/AIDS amongst pregnant women. Adults HIV prevalence has stabilised at a high rate, estimated at 17,8% in 2009. Considerable provincial variation is reported, ranging between KZN (25.8%) and the Western Cape (5.3%) in 2008. Clearly KZN has serious HIV/AIDS problems and more research work needs to be done to find out how two provinces in the same country can have such extremes with regard to HIV/AIDS variations (UNICEF, 2011; HST, 2011).

The overall number of annual deaths, increased sharply from 1997, when 316 559 people died to 2006 when there were 607 184 deaths. Even young adults are severely affected and infected by AIDS and are particularly shouldering the burden of the increasing mortality rate, in 2006 alone, 41% of deaths in RSA were attributed to 25-49 year olds and up to 29% in 1997, which is a clear indicator that HIV/AIDS in RSA is a principal major or causative factor of overall deaths (RSA, 2009).

A study conducted in Johannesburg in 2004, revealed that pregnant women suffer the most. The study revealed that out of 8 221 deliveries, 1 234 (15%) were HIV positive and had a transmission rate of 8.7% at 6 weeks and 8.9% at 3 months of age (Sherman, Jones, Coovadia, Urban & Bolton, 2004). HIV/AIDS in pregnancy is a reality, more than 70% of infants do not return for a HIV rapid test at 4 months old thus exposing them to complications of HIV/AIDS. Mobilisation of various communities across all borders is evident, WHO facilitate health standards and strongly believe that Head of States must work tirelessly to improve the quality of life for pregnant women. The global plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive should ensure optimal quality health for both mothers and children if properly implemented and regularly evaluated (UNAIDS, 2011).

Poor HIV positive pregnant women face the ravages of HIV/AIDS in uneven proportions; often they bear the heaviest brunt of the epidemic, as health providers, as persons living with HIV/AIDS and as the pivotal points of every society. A new diagnosed pregnant women is expected to perform her usual duties as expected by the community and African communities do not allow affected people to ventilate openly or be given support, instead they are expected to carry out their roles without fail (Onyong, 2008).

Recent studies on PMTCT believe that it is possible to stop new HIV infections among children and keep their mothers alive. Women living with HIV and their children have timely access to quality life saving antiretroviral drugs for their own health, as indicated, or as a prophylaxis to stop HIV transmission during pregnancy, delivery and breastfeeding (Sedibe & Goosby, 2011).

The study conducted by Sedibe and Goosby (2011) indicated that a well implemented PMTCT programme irrespective of the country's background can reduce MTCT by 5%, thus preventing HIV infection among women at increased risk of HIV.

WHO (2011), has noted progress on ten low and middle income countries, including three countries with generalised epidemics (Botswana, Namibia, and Rwanda) and seven countries with concentrated or low level epidemics (Cambodia, Chile, Croatia, Cuba, Guyana, Nicarhghard, Slovakia) have achieved universal access commonly understood as providing ART to at least 80% of the people in need.

Factors that support PMTCT intervention: Maternal mortality

The HIV/AIDS impact became worse in 2005, where 38.6 million people world-wide were living with the epidemic, 4.1 million were estimated to be newly infected while 2.8 million lost their lives to AIDS. Boniphace (2009) like many health science researchers also declared Sub-Saharan Africa as a global AIDS epicentre. Eastern and Southern Africa has 1:3 pregnant women with HIV infection.

Globally, 33 million people in 2007 were living with HIV/AIDS; 1.9 million persons (1.6-2.1 million) were recorded as newly infected with HIV. Sub-Saharan Africa accounted for 67% of all people living with HIV and 75% of HIV/AIDS related (Relf, Mekwa, Chasokela, Nhlengethwa, Letsie et al, 2011). The researcher is puzzled to learn that Sub-Saharan Africa rates the worst in the entire world; Africa is marked by poverty, political instabilities and high rates of unemployment and limited health resources. Research continues to reveal alarming figures of HIV/AIDS, recommendations are made and programmes like PMTCT, VCT, DOTS appear fruitless (Kunene & Kekana, 2009; Boniphace, 2009).

The global community has suffered grossly from maternal mortalities. The recent surveys begin to reveal a slight improvement and a decline in child mortality and more countries are striving to achieve the MDGs, a set of anti-poverty policies agreed by 189 countries in 2000 (Human Right Watch, (HRW) 2011). Most countries hope to reduce maternal mortalities from 358 000 as occurred in 2008 by 34%, however, the United Nations (UN) stated that such decline is insufficient to meet the 2015 deadline, so poor women continue to die every year as a result of preventable and treatable complications of pregnancy and child birth and especially HIV/AIDS (HRW, 2011).

The RSA is regarded as the most developing African country, and the global community salute RSA for having the most developed infrastructure, yet maternal mortality rate (MMR) is extremely high, more than any country in Sub-Saharan Africa. It is declared to have more than quadrupled in the last decade, leaping from 150 to 625 deaths per 100,000 between 1998 and 2007. The main reason attributed to such recorded deaths is HIV/AIDS, which could have been prevented through proper implementation of PMTCT (HRW, 2011). The deaths of pregnant women is persistent in RSA, irrespective of PMTCT, and HAART. RSA women die of HIV/AIDS related diseases and infants still contract HIV either during birth or post-delivery through breastfeeding.

According to HRW (2011), increasing numbers of maternal mortality rates are influenced by short comings of accountability and oversight mechanisms that authorities use to monitor health care systems, performance, identify failings and needs, and make timely interventions. Eastern Cape Province in RSA fails to implement PMTCT and to render moral and ethical maternal and child screening and continues to deliver ineffective information in addressing the recurring health system problems contributing to maternal mortalities.

Maternal health is an important global health priority; nearly 400 000 women die during childbirth each year and many more suffer significant morbidity. Maternal mortality is high in RSA more than any other middle-income country (Blaauw & Kekana, 2010). The South African government is committed in improving the quality of maternal health; however, according to Kunene and Kekana (2009), RSA is one of the only 12 countries in the world where child and maternal mortality rates have actually increased since 1990. HIV/AIDS remains alarmingly high amongst pregnant women and the National Department of Health has acknowledged that RSA has not done enough to tackle the epidemic (Blaauw & Kekana, 2010)

WHO (2005), conducted a study in Vietnam, and identified pregnancy related complications and HIV/AIDS as leading causes of death and disability for women of reproductive age. The study identified many other causative factors of maternal mortality, special focus is given to HIV/AIDS among expecting mothers; this study was conducted in seven geographical regions of Vietnam to give an in-depth analysis of all factors that relate to maternal deaths. It revealed that there has been no improvement in maternal mortalities, the ratio remains falling from 200 per 100 000 live births in 1990 to 100 per 100 000 live births in 2000. The study also revealed that maternal mortalities were prevalent in mountainous and remote areas (WHO, 2005).

In developing countries like RSA and other Sub-Saharan countries, pregnancy and childbirth are the leading causes of maternal mortalities. Maternal mortalities globally account for at least 18% of the burden of disease in this age group, more than any other single health problem. WHO (2005), pertaining to maternal mortalities, 585 000 women die globally every year. According to Blaauw & Kekana (2010), they indicate HIV as a cause of maternal death as complicated; HIV statistics are rampant among reproductive ages. Pregnancy and HIV certainly interact to cause what would be classified as indirect maternal deaths but a HIV positive status may obscure a direct obstetric cause of death and some HIV deaths may be incidental to the pregnancy. Sub-Saharan Africa is rated as the first region with the hardest hit with MMR of 14:100,000 followed by South Asia with a ratio of 280: 100,000. Maternal mortalities in developing countries like Sub-Saharan Africa is solely blamed on poor equipment resources, and poor health infrastructure (HRW, 2011).

Maternal mortality is a global problem and is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy while excluding accidental or incidental causes (WHO, 2005). More than 58 000 deaths worldwide per year are classed as maternal mortalities with 98% occurring in developing countries (WHO, 2005). Kunene & Kekana (2009) state that other health indicators have improved over the last two decades but maternal mortality rate and ratio have hardly changed and complications of pregnancy and child birth remain the leading cause of preventable death among women of reproductive age.

In RSA (Blaauw & Kekana, 2010) indicated a more careful analysis of deaths attributed to AIDS and it revealed that 255 of AIDS related deaths were also found to have a direct obstetric cause of death. Reclassifying these deaths by a direct obstetric cause of death produces adjusted figures. Deaths (24) diagnosed as AIDS without a HIV test result and 138 deaths of HIV positive patients with TB (tuberculosis) that should have been classified as AIDS (Blaauw & Kekana, 2010).

The RSA has a serious challenge with regard to saving mothers and children, as per a recent countdown to the 2015 initiative of maternal, new-born and child survival (Nicol & Bradshaw, 2011; DOH, 2010), RSA has been identified as one of 68 countries with a high burden of maternal and child mortality and one of the 10 countries with least progress towards achieving target 4 of the Millennium Developmental Goals. Disgracefully, the South African Department of Health had uncertainty with exact levels of child and maternal mortality rate. Data was reported missing, incomplete or of poor quality for evaluating maternal, new-born and child programmes (Nichol & Bradshaw, 2011).

Factors that support PMTCT intervention: Infant mortality

A right to survival is viewed as a fundamental right of all worlds' children and international stakeholders believe that children must be protected against all odds at any cost to preserve humanity across all borders. According to Sheahan (2010), children survival is a legal matter, procedures of saving babies include laws, policies, and recognised programmes to deal with the direct and indirect causes of child survival such as: developing primary health care (for immunisations, and integrated management of child illnesses), combating malnutrition (feeding schemes), providing clean drinking water and sanitation, providing pre and post natal care, promoting breastfeeding, preventing early marriage, providing access to health education, preventing diseases, preventing HIV/AIDS and provision of comprehensive and universal birth registration.

Poor implementation of PMTCT will lead to forever increasing numbers of infant mortality (WHO, 2007). HIV/AIDS among international communities is a reality, babies are infected on a daily basis through MTCT resulting in rampant paediatric AIDS and most research agrees that HIV/AIDS in children is a great tragedy (Minnie, Klopper, & Walt, 2011). The world has an unprecedented opportunity to make new HIV infections among children a thing of the past. In 2009, 370 000 children became newly infected with HIV globally (Sedibe & Goosby, 2011).

Since the beginning of the HIV epidemic, it is estimated that nearly 5 million children are currently living with HIV/AIDS, most of them born to HIV/AIDS positive parents and having acquired the virus before birth, during delivery and through breastfeeding (Boniphace, 2009).

Globally, 4 000 families are shattered by grief. The daily loss of so many young children from HIV/AIDS could have been prevented through proper implementation of PMTCT in communities (Sheahan, 2010). UNICEF (2008) state that nearly nine million children died before reaching the age of five globally in 2008. Sub-Saharan Africa has alarming figures of 20% of child mortality caused by HIV/AIDS (Rollins et al, 2007). HIV/AIDS fatalism is uncontrollable, so even protection of children in developing or low-income countries is still a daunting task as Africa is in serious financial constraints (WHO, 2008).

Stringer, Chi, Chintu, Creek, Ekouevi et al (2008) believe that prevention of MTCT remains a largely uncontrollable epidemic and high rates of infant mortality is evident in Sub-Saharan Africa, and more HIV positive pregnant women are in Africa which is under-resourced with poor health care infrastructure that can barely assist the 800 000 children believed to be infected each year.

The statistics indicate a sharp increase and it is alarming to compare 2005 and 2008. In 2005, half a million children died of HIV/AIDS globally (UNAIDS, 2005). A UNICEF (2008) study revealed nine million recorded HIV/AIDS deaths. RSA has the largest number of people living with HIV and many children are HIV positive or become ill and die due to AIDS. HIV transmission occurs before, during birth and breastfeeding, sexual intercourse with adults or in sexual violence against children (Johnson, 2009). Based on these two studies, it is clear beyond a reasonable doubt that if the governments do not act faster than expected the global community shall succumb to HIV/AIDS. Most of these infections were reported to be from Africa and nearly all were due to MTCT (Chopra & Rollins, 2008). Between 1998-2007, the Eastern Cape had an alarmingly high infant mortality (60.3: 1000) followed by KZN (60: 1000) and only Western Cape Province was trying hard to reduce infant mortality (25.3: 1000) (Mckewrrow & Mulaudzi, 2010). More than 90% of these deaths were HIV/AIDS related (diarrhoea, pneumonia, measles and many more (Perez et al, 2004) while South African children died of HIV/AIDS and other predisposing or underlying factors that increase their vulnerability and risk of death. In RSA, there are two common underlying factors, HIV infection and malnutrition. On average over 50% of children who died in 2007 were known or suspected to be HIV positive. Interprovincial variations were noted, Limpopo where HIV infection was associated with the greatest proportion of childhood deaths, had an U5MR of 49.1: 1000 which is the third lowest of all provinces although Western Cape had both the lowest proportion of HIV associated deaths and U5MR .

Most children die in Uganda of HIV/AIDS because their mothers had not been tested, the Ugandan study on PMTCT implementation revealed that pregnant mothers were reluctant to test, had incomplete follow-ups, were afraid of the stigma and as a result exclusively breastfed. Some clients would collect HIV/ART prophylaxis and never used them until the birth due to fear of being patronised by the in-laws (Nuwaga, 2007). HIV/AIDS accounts for 40% of child mortality in RSA especially in children under 5 years of age. According to Perez et al (2004), Zimbabwe accounts for 60% of childhood mortality, which coexists with other childhood diseases like malaria in a country that suffers poverty and has a poor public health service. According to Statsa (2010), AIDS is regarded as the main contributory factor of RSA infant mortality and infant mortality remains high in RSA. Numbers increased

from a ratio of 44: 1000 mortalities between 1990 and 2001 to 578: 1000, however a slow decline has been noted since 2003 to 47: 1000 in the year 2010 (Statsa, 2010; Rollins et al, 2007). Child mortality rate in RSA is controversial and government officials use different calculation formulas and as such there is no consistency. The data from the Department of Health was viewed as not credible and eventually in 2009, the DOH decided to use one formula in mortality rate estimation, that of calculating the under-five mortality rate scale (U5MR of 58: 1000), but has since adopted the figure of, 69: 1000 derived from the ASSA model, which is also used by the Presidency (Mckarrow & Mulaudzi, 2010).

According to Sheahan (2010), in a study conducted in Bangladesh, China, Democratic Republic of Congo, Ethiopia, India, Nepal, Nigeria, Pakistan, Sierra Leone, Tanzania and Uganda, concluded that child mortality is directly caused by diseases like malaria, measles, pneumonia, anaemia, intestinal infectious diseases and diarrhoea, acute respiratory diseases, meningitis and neonatal conditions. In addition, the study acknowledges that direct causes of child mortality do not arise in a vacuum and that states must also respond to indirect causes which affect children's right to survival which may include pandemic HIV/AIDS, lack of resources, good quality and easily accessible health systems, poor water supply, hygiene, sanitation practices, pandemic malnutrition and lack of access to antenatal and neonatal care, amongst others.

HIV/AIDS has a tremendous negative impact on infancy and leaves South African children emotionally challenged and devastated. According to Harrison (2011), HIV/AIDS in RSA is estimated to be affecting 330 000 teenagers (HIV positive) by the year 2009; the figure has doubled by 2011. The study revealed that mother-to-child transmission was indeed a mode of spreading the virus in 11% of South African HIV/AIDS population irrespective of PMTCT implementation and other related HIV/AIDS programmes such as HCT, VCT, and PICT (Statsa, 2009; Harrison, 2011).

Children are still infected with HIV by their mothers during and after birth, a HIV positive child born into a family where the virus is the hardest hit on a family health status affects the household income, productivity and ability to care for each other (Harrison, 2011). The younger generation and child bearing age groups are most affected by HIV in RSA (Kunene & Kekana 2009:10) and parents die while their offspring are young. Recent studies show that premature deaths have risen due to HIV/AIDS. Figures of such HIV/AIDS related deaths and complications have significantly risen from 39% to 75% in 2010 (Harrison, 2011; Kunene & Kekana, 2009). DOH (2008) revealed that 80% of the sample in the survey conducted in RSA with a view to analyse the impact on HIV in a RSA household lose more than half their capita of income with the death of the higher income earner. HIV/AIDS orphans infected by parents are exposed to victimisation, discrimination and poverty. Thus putting enormous pressure on relatives due their to their ill health and need for relocation. Relatives may split siblings apart for affordability and others are sent to places of safety thus causing more harm on their development (UNAIDS, 2010).

Infant feeding exposes infants to a greater risk of contracting HIV. RSA recommends exclusive breastfeeding for a period of six months if the mother is infected (DOH, 2010). A study conducted in Botswana, Kenya, and Uganda in 29 health districts offering PMTCT reflected that (234/334, 70%) health professionals who were randomly included in the study did not correctly estimate the transmission risks of breastfeeding irrespective of PMTCT training exposure (Chopra & Rollins, 2008). So mothers cannot be fully held accountable for MTCT in the year 2008, given the fact that health personnel's knowledge of MTCT during breastfeeding was not accurate. Mixed methods of infant feeding in HIV exposed infants is dangerous and could result in infecting an infant (DOH, 2010). Chopra & Rollins (2008) indicate that only 307 of 640 (48%) of participants discussed breastfeeding with confidence and such discussions were rated as poor by most in receipt of such services. The dilemma of infant feeding insight must be addressed in PMTCT training sessions and it is crucial and plays an important role in sustaining the PMTCT (Tint, Doherty, Nkonki, Witten & Chopra, 2003; Chopra & Rollins, 2008; DOH, 2010).

RSA drafted a policy directive for the implementation of South Africa's declaration on support of exclusive breastfeeding and revised guidelines on infant and young children's feeding. The aim was to ensure smooth implementation of strategies aimed at promoting exclusive breastfeeding and the recommendation on infant and young children's feeding in the context of HIV (RSA, 2011). The RSA policy on breastfeeding stipulates that RSA is committed, and declared RSA as a breastfeeding friendly country, and views breastfeeding as a public intervention to optimise child survival irrespective of the mother's status. The RSA's policy of breastfeeding is adopted from an international health body (WHO 2010:4) and current alarming figures of child mortality (DOH, 2010). The RSA health department promotes exclusive breastfeeding with caution as mixed method of feeding by an HIV infected mother makes an infant prone to HIV, so breastfeeding is implemented with great concern and mothers

are urged to be under strict supervision as they endeavour to breastfeed in RSA (DOH, 2010; WHO, 2010; Chopra & Rollins, 2008; Kunene & Kekana, 2009; Tylleskar et al (2011); RSA, 2011).

According to Doherty, Sanders, Goga & Jackson (2010), HIV causes mortality, HIV in mixed method of feeding causes mucosa breakdown on the gastro-intestinal tract lining and children become more prone to HIV, however, good PMTCT implementation and proper HAART coverage for both the infant and mother will prevent MTCT and children's health with breastfeeding will improve, escalating infant mortality rates in RSA. A study conducted by Chopra and Rollins (2008) indicated knowledge gaps on the safety of breastfeeding by HIV positive mothers and that misleading information given to HIV positive mothers may have led to MTCT during breastfeeding. A similar study (Doherty et al 2010) recommended that RSA decide on a single infant feeding practice that be promoted and supported in general and in particular among HIV positive women attending public health facilities. Therefore the DOH (2010) adopted the idea of exclusive breastfeeding for 6 months with comprehensive HAART or prophylaxis coverage during the period of breastfeeding and longer. The RSA government embarked on a gradual process of withdrawing the provision of free infant formula milk as part of the PMTCT programme for child survival.

Knowledge of PMTCT programme and HIV/AIDS management is extremely important in ensuring effective PMTCT programme execution. Knowledge is power; a well-informed health professional will strive to save mothers and children, and will have a positive attitude conducive for HIV positive pregnant women to open up. A study on HIV/AIDS and universal precautions: knowledge and attitudes of Nepalese nursing students discovered that Nepalese nursing students had a large knowledge gap and negative attitudes, regardless of the level of education and even failed to observe universal precautions (Mohat & Eller, 2009). The future of health discipline lies in the hands of these prospective health professionals; thus Mohat and Eller (2009) concluded that health sciences curriculum must include comprehensive, adequate and culturally relevant material to ensure a warm environment for HIV positive pregnant women.

Australia differs in terms of knowledge and attitude towards it's HIV/AIDS population. An Australian study revealed that health professions in Australia have a positive attitude and effective knowledge of HIV management. The vast majority (95.7%) of participants demonstrated a positive attitude towards caring for people living with HIV/AIDS and only 4.3% demonstrated negative attitudes (Pickles, King & Belan, 2011). Iranian nurses knew more about HIV/AIDS acquisition and associated HIV prevalence with drug abusers, (97.3%) of respondents answered correctly which makes it clear that they had good knowledge of HIV/AIDS, however, refined insight on PMTCT is not mentioned in the study (Hasari, Aghamolaei, Tavafia & Sabili, 2010).

A Nigerian study also revealed positive attitudes towards HIV/AIDS management and even felt the need to educate adults about HIV/AIDS to ensure extended horizons for a population living with HIV/AIDS and for adults to understand the exclusive feeding method if the mother is infected (Akpabio, Asuzu, Fajemilehik & Ofi, 2009). However, the Nigerian study failed to address and evaluate PMTCT knowledge; strangely, the concept of confidentiality as an ethical principle, which is over emphasised and misused by many spouses or sexual partners who keep their HIV status anonymous, even if it means infecting their partners (Akpabio, Asuzu, Fajemilehik & Ofi, 2009).

An attitude of a health professional can have either a positive or negative impact on HIV/AIDS management. HIV positive pregnant women can be emotionally imbalanced and vulnerable and in the process rely on the attitude of a health professional to either open up or remain silent. Based on the researcher's experience with pregnant women in the clinical setting, pregnant women complain of midwives arrogance and crippling verbal abuse. A study conducted in China, revealed that Chinese nurses opted for average knowledge and remained neutral and their attitude improved after training on handling HIV/AIDS affected individuals during their pregnancy (William, Wang, Burgess, Chenghuie, Gong et al, 2004).

Haiti health professionals at nursing training levels did not obtain sufficient training in HIV/AIDS at pre-service levels to carry out important demanding epidemic prevention, care and treatment. As a result, academics had to quickly step in and urgently revise the curriculum to ensure that Haiti nursing graduates have competency in HIV/AIDS related knowledge, skills and attitude (Knebel, Puttkammer, Demes, Devirois & Primsy, 2008).

Proper training of nursing personnel was necessary for nursing staff to render effective HIV/AIDS care due to a shortage in physicians. WHO (2007) made provisions for training less specialised health professionals to support the delivery and monitoring of HIV/AIDS prevention, care and treatment.

Historically, people from all social classes have feared HIV/AIDS right from its origins and associated it with immorality of sexual practices such as homosexuality, adultery, fornication, and prostitution. Conservative rural

communities are facing the challenge of having children with HIV entering school; living within their vicinity and they continue to demonstrate fears of the unknown. Health care providers' attitude towards HIV/AIDS influences their effectiveness in prevention activities and care of HIV/AIDS infected individuals (Mohat & Eller, 2009; Yoder, Preston & Forti, 1997).

Pickles, King & Belan (2009) concur that health providers still have issues and negative attitudes towards people living with HIV/AIDS. Research shows that health professionals are reluctant to provide care to individuals infected with HIV/AIDS, the study revealed that even nursing students allocated to maternal and child services have a negative attitude towards HIV/AIDS, have enormous fear of contracting HIV, homophobia and continue to indirectly perpetrate stigmatisation of infected individuals and the study was done in different regions of the world and indeed health professionals appeared to have a similar understanding and attitude towards HIV/AIDS (Pickles et al, 2009).

Caregivers and non-caregivers in Nigeria demonstrated positive attitudes and sympathy required when dealing with HIV/AIDS orphans. Research participants even promised to improve attitudes and behaviour related to caring for individuals affected and infected with HIV/AIDS (Ohnishi, Nakamura, Kizuki, Serio, Inose & Takano, 2008). Nigeria has an estimated 930 000 AIDS orphans and AIDS has a negative impact on family's and the community, while Sub-Saharan Africa had 43 million orphans in 2003 which is the largest statistic worldwide and still by 2010, 20 million more children were estimated to be orphaned by AIDS (Ohnishi et al, 2008).

Indian health professionals and their facilities are adequately prepared to manage and care for HIV/AIDS patients. The role of nurses in PMTCT is acknowledged and it appears that India does not deal with fears of occupational risks positively, with regard to HIV/AIDS management, thus leading to elements of HIV/AIDS stigmatisation and discrimination (Pisal, Sutar, Sastry, Kundu, Jashi et al, 2007).

The researcher strongly believes that PMTCT programme is delicate and it is a specialised field demanding a health worker's attention. PMTCT is a unique programme that when misinterpreted could lead to lifelong victimisation. In general, PMTCT insight is extremely important and several precautions must be taken into account to protect both the mother and infant. Relf et al (2011) share a similar view, and insist that PMTCT programme ought to be implemented by highly qualified, competent nursing workforce and in RSA context an Advanced or experienced midwife/achoucher.

More funds have to be made available to facilitate fast tracking access to ARTs, training nursing personnel to initiate and maintain ARTs while evaluating its effectiveness, monitoring adverse reactions, reduction of other drug interactions (including herbs from local traditional healers) (Relf et al, 2011). HIV is grounded on fear, ignorance and social disapproval of groups heavily affected by HIV. The epidemic of stigma and discrimination frequently overwhelms the ability and willingness of communities and countries to respond to HIV. People living with HIV in various parts of the world lost their jobs, homes, and even access to health care facilities and other public services (UNAIDS, 2011).

HIV/AIDS is rampant among children, a study conducted in South Africa by Rollins, Little, Mzolo, Horwood & Nowel (2007), indicated anonymous HIV prevalence screening of all infants at immunisation clinics is feasible, to monitor the impact of PMTCT programmes on peripartum infection; linked screening could identify infected children early for referral into care and treatment programmes. The study revealed that in samples collected from 2 489 infants aged 4-8 weeks. HIV antibodies were identified in 931 infants [37.4%; 95% confidence interval (CI), 35.4-39.4], of whom 188 were HIV RNA positive. The estimated vertical transmission rate (VTR) was 20.2% (95% CI, 17.8- 23.1%); 7.5% of all infants at this age were infected. Amongst mothers who reported that they had taken a single dose nevirapine for PMTCT, VTR was 15.0%. Amongst those who reported not being HIV infected but whose infants had HIV antibodies, VTR was 30.5%. Infant mortality rates in KwaZulu Natal increased from 28/1000 live births in 1990-1994 to 92/1000 in 2000-2004 (Rollins et al, 2007).

The KZN study revealed the alarming reality of HIV/AIDS among children in the province; 20% of children attending immunisation were born to HIV positive mothers and were also positive themselves (Rollins et al, 2007). Yet PMTCT coverage in KZN is reported to have been introduced in almost all clinics and hospitals within the province. The attendance of both ANC and immunisations in clinics of KZN is generally high and yet HIV/AIDS remains at 15.8% (Rollins et al, 2007; Kunene & Kekana, 2009; WHO, 2008). Such alarming revelations indicate a serious health system failure, the same study revealed a number of infants 37% were found exposed to HIV and their mothers were between 20-29 years of age. KZN province has a serious HIV/AIDS dilemma and most studies regard KZN as the home of HIV/AIDS with high maternal and child mortality rates. A study conducted in Johannesburg in

2004, recommended that children must be followed up to ensure an AIDS free generation, record keeping systems that document all facets of the PMTCT service need to be designed to facilitate regular audits and interventions. Early HIV diagnostic algorithms will improve identification of HIV infected children and enable HIV affected children to access appropriate health care which is cost effective (Sherman et al, 2004). Sedibe and Goosby (2011) believe that a well mobilised global community will ensure that no child should be born with HIV; no child should die due to lack of access to treatment as in high income countries, the number of new HIV infections among children, and maternal and child deaths due to HIV is virtually zero. In low to middle income countries too few women are receiving HIV prevention and treatment services to protect themselves or their children.

South Africans mobilisation on PMTCT was evident in the country, a series of preventive programmes were introduced one after the other (Horwood et al, 2010). A national AIDS plan was launched in 1994-1995 and a partnership against AIDS was launched in 1998. South African National AIDS Council (SANAC) was established in 1999. The main objectives or mandate of SANAC was to oversee the national response to the pandemic and implementation of the strategic plan, facilitating collaboration between government and other sectors. The country got mobilised at all levels, more ideas were generated to combat HIV especially amongst pregnant women, strategic plan on HIV/AIDS of 2000-2005 addressed all relevant issues, although WHO was not impressed and it was eventually revised in 2009 and launched in 2010, the criteria for HAART enrolment was revised based on 350 CD4 count.

Elimination of HIV amongst children is not a South African concept or plan but rather a global consensus that the world must strive towards the elimination of HIV/AIDS infections among children by 2015 and keep mothers and children living with HIV alive, most low and middle countries have already moved significantly towards achieving these goals (Sedibe & Goosby, 2011).

Children are vulnerable and defenceless against HIV contraction. A child does not decide on conception but is randomly conceived and out of ignorance a mother fails to attend ANC and preventable congenital disorders are not identified until birth. Even during birth, an innocent child can become infected with HIV. Globally, children under the age of 15 account for one in six AIDS related deaths and one in seven new HIV infections. The 15 million children under age 18 have lost one or both parents to HIV/AIDS and countless children become responsible for the care of their siblings and other family member when parents succumb to the epidemic (Relf et al, 2011). The researcher has observed AIDS orphans subjected to discrimination, sexual assaults, slavery and cheap labour. Relf et al (2011) cited UNAIDS & UNICEF 2004 stating that child-headed households, or children living on the streets are at a greater risk for exploitation, abuse, exposure to HIV, and poverty.

PMTCT implementation issues in South Africa – An analysis of the evidence

Most developing and developed countries require PMTCT to preserve humanity and children's survival. All dynamics around PMTCT implementation seek commitment from all stakeholders at different levels to ensure elimination of new HIV infections in children. In 2010, 48% of pregnant women living with HIV in low and middle income countries (716 500 of 1.49 million) received effective antiretroviral regimens excluding single dose nevirapine. An estimated 35% of pregnant women living with HIV in low and middle countries received an HIV test in 2010, up from 7% in 2005. HAART coverage has increased from 1.48 million infants born to mothers living with HIV to 32% to 42% (WHO, 2010).

Children are the future of any country whether developing or developed and people in power ought to invest in proper child development for the sake of the states sustainability. WHO (2010) indicate that children of the world are receiving sub-standard attention from existing leadership, figures indicate that children in low and middle income countries receiving paediatric HIV treatment has increased from 71 500 in 2005 to 456 000 in 2010 and this is totally unacceptable as it account for only 23% compared to 51% of adults (WHO, 2011).

HIV/AIDS in South Africa is a national burden and the South African government is strategising on combating the epidemic of HIV but no improvement has been noted (Statsa, 2008). According to Jewkes (2009), an estimated 5.6 million people were living with HIV and AIDS in RSA in 2009, more than in any other country. UNAIDS (2010) states that in 2009, an estimated 310 000 South Africans died of AIDS. The hardest hit age group being 15-49, the age group that PMTCT was aimed at assisting. Almost one in three women aged 25-29, and over a quarter of men aged 30-34, are living with HIV. HSRC (2009) noted that HIV prevalence among those aged two and older also varies by province with Western Cape (3.8%) and Northern Cape (5.9%) being least affected, and Mpumalanga (15.4%) and KwaZulu Natal (15.8%) at the upper end of the scale. Clearly, RSA requires assistance with regard to

HIV/AIDS prevention, and management. Poor South Africans continue to suffer from HIV/AIDS related conditions and current efforts do not seem effective enough to bring relief to world communities (DOH, 2010; Kunene & Kekana, 2009).

In response to the HIV/AIDS pandemic, the South African government launched various programmes such as VCT for clients to test voluntarily, PICT (provider initiation counselling and testing) all government health employees were urged by the government to coax all clients to test and know their status, HCT (hospital counselling and testing), all health institutions since 2009 were urged to offer HIV and AIDS services and HCT programme was fully implemented by April, 2010 in South African health institution, M2M (mother to mother support and counselling) matriculant HIV positive and on treatment (ARVs) women were employed post-delivery for a period of one year to give support and counselling to mothers who were pregnant and newly diagnosed with HIV. PMTCT in 2002 was launched in RSA for pregnant women to be tested separately and fast tracked to HAART to ensure a HIV free generation, Khomanani, Soul City programmes on media ran concurrently to bring about HIV awareness and prevention of HIV/AIDS, amazingly RSA in 2010 is still suffering the hardest hit of HIV and AIDS despite all these fully implemented HIV/AIDS programmes (Statsa, 2008; UNAIDS, 2010; RSA, 2007; WHO, 2009).

The Department of Virology in the University of KwaZulu Natal (UKZN) (Ndungu, 2011) has discovered that certain individuals have intracellular protein that blocks HIV replication and such intracellular protein cripples the replication and such findings will be utilised to design a vaccine against the virus. The study discoveries were done in RSA which shows the determination of RSA as a whole to fight HIV/AIDS, not only after HIV infection but also to prepare the nation to resist the HIV/AIDS through scientifically approved vaccinations.

The PMTCT programme in RSA has been modified and transformed based on scientific knowledge presented to improve the health status of pregnant women within the country (DOH, 2010). A series of studies were conducted to ensure a safe vaccine against HIV (Ndungu, 2011). Any study on improving the lives of HIV/AIDS affected and infected population is extremely welcome and no amount of research is enough until a cure is found (DOH, 2010). Most studies continue to reflect RSA as being among countries that obtained 80% of PMTCT coverage, 20% remains a high concern in RSA. It is appreciated that 22 countries are working tirelessly to eliminate MTCT, five countries reached the goal of providing effective regimens for preventing MTCT to 80% of pregnant women living with HIV, these were Botswana, Lesotho, Namibia, South Africa, and Swaziland (WHO, 2012).

The PMTCT 2002 inception in RSA compelled the South African government to mobilise pregnant mothers to attend ANC as early as possible and to ensure that components of PMTCT, as stipulated by WHO (2007), are adhered to. To ensure that pregnant women do not expose infants to HIV/AIDS. According to Sherman et al (2004), PMTCT is a national programme that had to be evaluated regularly by all stakeholders involved ranging from Universities, Government, WHO and significant others. The PMTCT programme in its fundamental developments emphasised and ensured voluntary counselling and testing (VCT), administration of NVP to mother and baby; provision of free child formula for the first 6 months of life, and follow up for infants on Co-trimazole prophylaxis from 6 weeks of age to 12 months of age when their HIV infection status was determined using an HIV enzyme linked immunosorbent assay (ELISA) test. In mid- 2007 a huge study was proposed to evaluate the effectiveness of PMTCT in Africa and it was known as PEARL (PMTCT Effectiveness in Africa: Research and Linkages to Care and Treatment). It was a consortium project funded by US centres for disease Control and Prevention and the Elizabeth Glaser Paediatric AIDS Foundation. The proposed study sought to determine the impact of PMTCT services in Cameroon, Ivory Coast, South Africa and Zambia and PEARL was the first to utilise the novel community based methodology to evaluate the effectiveness of PMTCT services in a variety of settings (Stringer et al, 2008). Even to date little has been published on PEARL and maternal and infant mortality rates remain rampant in Africa.

Despite all HIV/AIDS programmes available in South Africa, studies still show that 40 000 children in the RSA are infected with HIV on an annual basis, reflecting either poor patient adherence or improper implementations of such programmes (Statsa, 2010). The studies still show that there is no consensus gold standard to assess population effectiveness of PMTCT programme and most researchers believe that the evaluation model for PMTCT is an urgent public health issue and most countries and researchers ought to deliberate on this matter (Stringer et al, 2008). In 2009 (30%) of the pregnant women in RSA were HIV positive, which was a clear indication that South Africa was in great need for an effective and efficient PMTCT programme and the South African health system was severely criticised for failing to reach the WHO target and recommendations (DOH, 2010).

Rollins et al (2007) claim that more funds and staff have been employed into PMTCT implementation and it still remains unclear to what extent these programmes have reduced the number of children becoming infected or dying of HIV each year. According to Rollins et al (2007), children who are HIV positive still come in huge numbers for consultation in public health institutions, often in critical immunological related conditions. However Rollins et al (2010) view implementation of PMTCT in RSA as an additional workload for already overworked staff in a weak health system. Lay counsellors were trained not only on HIV testing and counselling but also on PMTCT which assisted in the early success in increasing the coverage of PMTCT in KZN. The RSA joined the rest of the world and implemented PMTCT programme in 2002. The early stages of South African PMTCT were solely based on services rendered by lay counsellors while midwives continued with routine ANC, and resulted in huge conflicts that were difficult to resolve and further exacerbated poor PMTCT integration into routine maternal and child health services (Chopra, Doviaud, Pattinson, Fonn & Lawn, 2009).

RSA has implemented a range of measures at National and provincial levels to fight the epidemic and mitigate its impact. Various studies have been conducted in RSA to improve quality of life for people living with HIV/AIDS (DOH, 2010). Statutory bodies were formulated by the national government with a hope to improve HIV/AIDS management, National AIDS plan was launched in 1995 and the South African government called for partnership against AIDS in 1998 which was later followed by the formation of South African National AIDS Council (SANAC) in 1999 (DOE, 1999).

According to Horwood, Haskins, Vermaak, Phakathi, Subbaye and Doherty (2010), PMTCT guidelines in 2010 were in line with WHO standards, in sense that a 'cover-the-tail' strategy was well addressed in 2010 PMTCT guidelines which is used in HAART drugs AZT and 3TC for the mother during labour and post-partum to reduce the risk of HIV transmission and drug resistance.

Preventing mother-to-child transmission lies with the parents who in return rely on informed decisions and services provided by health professionals. WHO (2007) states that HIV transmission occurs during pregnancy, birth, or through mixed feeding methods by HIV positive mothers; globally, mother-to-child transmission accounts for 10% of all new HIV infections while over 90% of new infections in infants and young children occur through mother-to-child.

The PMTCT report 2005 cited by WHO (2007) indicted that RSA is amongst 10 countries that has two-thirds of mother-to-child HIV transmission followed by Uganda, Kenya, Tanzania, Zimbabwe, Mozambique, Nigeria, Democratic Republic of Congo, India and Ethiopia.

RSA opted to implement PMTCT as an international standard aiming at preventing HIV transmission from the mother to the child and embraced Millennium Development goals (MDGs) such as MDG4: reduce by two thirds the mortality rate among children under five, MDG5: reduction by three quarters the maternal mortality ration, MDG6: halt and begin to reverse the spread of HIV/AIDS (WHO, 2007). However HIV/AIDS in RSA remains uncontrollable with increasing figures of new HIV infections (Kunene & Kekana, 2009).

The international community is concerned with the spread of HIV/AIDS among pregnant women, PMTCT is being intensified in South Africa to the extent of legally allowing nurses to implement and commence anti-retroviral treatment especially among HIV positive pregnant women to ensure an AIDS free generation. Nigeria has also called for collaborative efforts for the development and implementation of a package for HIV prevention, treatment and care.

Developing and under developed African states have agreed on ensuring that 80% of pregnant women have access to antenatal care, and receive comprehensive information, counselling and other HIV prevention services, increasing the availability of and providing access for HIV infected women and babies to effect treatment to reduce mother-to-child transmission, as well as to voluntary and confidential counselling and testing (WHO, 2007).

More studies have been done on PMTCT, deliberations, consultations and recommendations have been made by both international and national bodies, but little has been done to improve the quality of life for pregnant HIV positive mothers and more new cases of HIV/AIDS are reported daily (WHO, 2007; Kunene & Kekana, 2009; DOH, 2008). The United Nations (UN) have devised a comprehensive approach to address a broad range of HIV-related prevention, care, and treatment and support needs of pregnant women, children and families. The U.N. approach has four well elaborated components namely; firstly, the primary prevention of HIV infection among women, especially young women, the aim of this component is avoiding infection in parents-to-be, which will help to prevent HIV transmission to infants and young children, as well as help towards other prevention goals. The emphasis is based on women at high risk and their partners, also mixed method of feeding has been identified as a

great danger of HIV transmission from mother-to-child. Secondly, the U.N. argues that unintended pregnancies among HIV infected women must be prevented so reproductive health (including family planning) services need to be strengthened so that all women, including those infected can make informed decisions about their future reproductive life, including when to seek appropriate support and services to prevent unintended pregnancies. Apparently women in developing countries do not know their sero status thus increasing more risk of unknowingly spreading HIV.

The U.N. eventually recommended that an increased availability of counselling and testing services would enable them to obtain essential care and support services, in order that they could make informed decisions about their future reproductive lives (WHO, 2007). Hence RSA introduced programmes like VCT, HCT, PICT and numerous awareness HIV and AIDS campaigns like Khomanani, Siyayinqoba and the RSA government went to the extent of collaborating with parastals such as Catholic AIDS programmes and MATCH for male circumcisions etc. (UNAIDS, 2010).

Thirdly, a provision of specific interventions to reduce HIV transmission from HIV infected women to their infants. WHO has identified a package of interventions for the PMTCT (DOH, 2010). It includes antiretroviral drug regimens for HIV infected pregnant women and their new borns, safe obstetric practices and counselling and support for HIV infected pregnant women on infant feeding options. Fourthly, provisions of treatment, care and support for HIV infected mothers, their infants and family care and support must be fully integrated into on-going efforts to improve maternal and child health services, and be tailored to the needs of women for safe and effective antenatal, obstetric and reproductive health services. Sexual and reproductive health interventions for HIV infected women and other care for HIV infected women and for children born to HIV infected mothers (WHO, 2007).

According to WHO (2007), PMTCT is a preventive strategy aimed at ensuring an HIV/AIDS free generation globally. WHO (2007) believes that primary prevention of HIV infection among women, especially young women can be obtained through proper and intensified health information and education, HIV testing and counselling regular retesting for those with high exposure, couple counselling and partner testing, safer sex practises, including dual protection (condom promotion, delay the sexual activities onset, and behavioural change communication to avoid high risk behaviour).

WHO (2007), UNESCO (2010), DOH (2010) share similar PMTCT sentiments of preventing unplanned pregnancies among HIV positive women and strict prevention of HIV transmission of mother-to-child by the entire global population through comprehensive and quality antenatal and delivery care. HIV testing and counselling in ANC, retesting in late pregnancy in high prevalence settings, clinical (staging) and immunological (CD4) assessment of pregnant women, ART prophylaxis for prevention of mother-to-child transmission for women not receiving ART and for all exposed children, safer obstetric practices, infant feeding counselling and support, family planning counselling and services to ensure women can make informed decision about their reproductive health, HIV testing and counselling in family planning services.

PMTCT programme makes specific provisions or requirements for HIV infected women ranging from ART for women eligible for treatment, co-trimazole prophylaxis, continued infant feeding counselling and support, nutritional counselling and support, sexual and reproductive health services and psychological support. A number of facilities providing ART rose from 18 386 in 2009 to 21 641 in 2010 in 109 reporting low and middle income countries representing an 18% increase in one year (WHO, 2011).

HIV exposed children as per WHO (2007) guidelines ought to be given ARV prophylaxis, routine immunisations and growth monitoring and support, with Co-trimazole prophylaxis starting at 6 weeks, early diagnosis testing for HIV infection at 6 weeks where virological tests are available. Continued infant feeding counselling and support, screening and management of tuberculosis prevention and treatment of malaria, the HIV infected immune system is prone to opportunistic diseases, the HIV positive individual is three times likely than that of the HIV negative person to contract TB (DOH, 2009; Kunene & Kekana, 2009). Nutritional care and support, psychosocial care and support, ART for eligible HIV infected children and symptom management and palliative care where required.

The WHO (2007) made specific PMTCT recommendations that all pregnant women except those confirmed with the infection, should be tested as early as possible in each new pregnancy and be fast tracked into PMTCT programme to ensure a HIV/AIDS free generation, repeat testing late in pregnancy to ensure that the baby is safe from HIV, even during labour women can still be tested if they have an unknown status or as soon as possible after delivery. A health provider has an obligation to offer HIV testing and to explain in-depth reasons why HIV testing and counselling is being recommended, explain clinical and prevention benefits of testing and the potential risks

such as discrimination, abandonment, or violence, to reassure the client of confidentiality, ARTs available, explain the right to decline that will not affect the patient access to services, if tested positive, equip with disclosing techniques especially to significant others and provide all available resources ranging from counselling, ARTs and support groups, feeding methods, use of pharmacodynamics aimed at preventing HIV transmission from mother-to-child and encourage exclusive breast feed for at least first 6 months.

The WHO proposed PMTCT in the year 2000, RSA implemented PMTCT in 2002, at the end of 2006, 71 countries were implementing PMTCT programmes and 45% of these countries had developed national scale-up plans with clearly defined population based targets and time bound benchmarks (WHO, 2007).

HIV transmission in pregnancy is a global burden; all countries had to devise constructive plans to combat HIV/AIDS and to promote PMTCT. According to WHO (2007), the international community affected/infected by HIV especially pregnant women at 11% received ARVs to prevent mother-to-child transmission, ranging from 77% and 29% in Eastern Europe and Latin America to 3% and 2% in West Africa and South Asia. However by the end of 2006, only 8 countries exceeded the 40% ARV prophylaxis uptake mark required to achieve the 2005 PMTCT UNGASS target of reducing new infections in children by 20% (Argentina, Belize, Botswana, Brazil, Jamaica, Russia, Thailand and Ukraine) (WHO, 2007). Whereas in Sub-Saharan Africa, maternal ARV prophylaxis uptake has more than doubled from 2004-2005 in three of the affected countries (Namibia, South Africa, and Swaziland). The reality of HIV/AIDS in poor countries means death as most households cannot afford exorbitant fees for ARTs regimen.

According to DOH (2010), PMTCT at ANC level aims at improving the quality of the mother's health and prevents mortality, identify women who are HIV positive, ensure PMTCT environment, prevent MTCT, provide AZT from 14 weeks of pregnancy or lifelong ART as soon as possible, depending on mother's clinical indication. South African studies confirm the importance of HIV testing and vigorous need for the implementation of PMTCT thus ensuring 100% PMTCT coverage to save both mothers and children.

The principal goal of PMTCT is to ensure an AIDS free generation and the PMTCT policy document (DOH, 2010) prescribes international standards for care and management of a pregnant woman, it states that all women of unknown HIV status should be offered HIV testing and counselling before discharge, preferably prior to or immediately after delivery, to ensure that the baby gets antiretroviral prophylaxis if the HIV test positive; all abandoned infants judged to be in their first 72 hours of life should be given NVP as soon as possible and then daily for six weeks, or until rapid testing of the mother or infant confirms the absence of HIV exposure, breastfed infants whose mothers are not on lifelong ART should continue NVP beyond 6 weeks of age until cessation of breastfeeding.

According to DOH (2010), PMTCT has two main stream aims, namely, negative testing followed by counselling while positive HIV results mean either prophylaxis or HAART, and even a child born by an infected mother must be given prophylaxis post birth for at least 6 weeks or a period equivalent to that of breastfeeding time. Ethically and legally, no South African during pregnancy is compelled to test. A health provider can only offer counselling and support, a client shall make an informed decision. The HIV/AIDS policy document as stipulated on clinical guidelines of PMTCT (DOH, 2010) allows free will or autonomy with regard to HIV/AIDS testing during pregnancy. As per WHO (2008) and DOH (2010), a mother refusing to be tested must at least receive individual 'post-refusal counselling' and be offered HIV testing at every subsequent visit in a non-coercive manner during ANC visits. RSA is extremely concerned with saving mothers and children from HIV/AIDS to the extent of allowing health providers to test mothers even on the onset of labour or immediately after birth (DOH, 2010).

WHO (2008), DOH (2010), Kunene & Kekana (2009) insist that quality education at ANC level can save mothers and children, if consistently done by a knowledgeable health provider and prescribe standards to be adhered to ranging from routine information about HIV testing and the PMTCT programme availability, render support using a group therapy approach, and later individual information sessions on a 'one on one basis'. HIV testing must be integrated into normal ANC routine tests such as haemoglobin, Rhesus factor, syphilis tests even rapid test and CD4 cell count must be done routinely if a mother tested positively. The information content given to pregnant women is very important and health providers must account and be responsible for information ranging from HIV transmission risks, safe sex and availability and use of condoms, contraception and future fertility, treatment options, MTCT, and HIV and possible interventions, partner testing, safe infant feeding options, for HIV positive women, prophylaxis for both mother and the child, stigma coping mechanisms and referral to support services such as M2M (DOH, 2010).

The health personnel must be made aware that PMTCT in RSA is aimed at ensuring that HIV is prevented among women of child bearing age, proper integration of reproductive health, child and adolescent health, CCMT and TB services, strengthening postnatal care for the mother baby pair, provision of an expanded package of PMTCT services, include routine offer of HIV counselling and testing for all pregnant women attending ANC, provision of provider initiated counselling and testing services (PICT) in the context of PMTCT, in facilities offering routine ANC, involvement of the partner and the family in order to ensure a comprehensive approach provision of appropriate regimens to prevent MTC of HIV according to the risk profile based on the HIV test, CD4 cell count, and clinical staging, provision of other appropriate treatments, such as those for opportunistic infections management and nutritional provision of psychosocial support to HIV positive pregnant women, provision of quality, objective, and individualised counselling on safe feeding methods, strengthened obstetric practices which reduce MTCT and provision of HAART and prophylaxis even for infants, integrated follow-up of infants born to HIV positive women through routine child health services, and the Integrated Management of Childhood Illness (IMCI) strategy, early infant HIV testing using HIV DNA PCR at 6 weeks of age for all infants born to HIV positive women (integrated with the EPI 6 week visit), irrespective of feeding option, strengthening of community based household and door to door activities to educate and enhance the utilisation rates and effectiveness of health programmes (DOH, 2010).

PMTCT barriers: A review of modifiable factors

The literature reviewed indicates barriers of PMTCT as being stigma attached to HIV/AIDS, mothers failing to protect infants against HIV/AIDS, lack of both human and equipment resources. However, Sedibe and Goosby (2011) discovered a different scenario in Maitama Public Hospital in Abuja in Nigeria and were inspired by a couple living HIV who were keen to have their first born free of HIV, the maternal clinic had all the necessary equipment to help an expecting mother and the staff were well trained and provided quality health care for the mother and child without stigma, and discrimination which is the hallmarks of a successful PMTCT programme (Sedibe & Goosby, 2011).

Relf et al (2011) believe that human resources in Sub-Saharan Africa is limited, physician workforce is limited or almost non-existent. Amazingly, Lesotho, Malawi, and Zambia have a physician ratio to population of 1:10.000 (WHO, 2008). All levels of nursing personnel comprise of the largest number of health care providers, although their shortage is often extreme. Most South African nurses since 2002 have opted for both European and Middle East countries for better working environments, effective remuneration, and better recognition. In developing and underdeveloped countries, there is insufficient human capacity to absorb and apply new mobilised resources because the workforce is unavailable, causative factors range from poor nursing training, nurses exiting clinic services due to ill health such as PTB (Pulmonary tuberculosis) and HIV/AIDS or other chronic conditions, retirement, or migration (Relf et al, 2011).

RSA has a huge number of pregnant women but their ANC attendance does not give a true reflection. Pregnant women do not attend available health facilities due to various reasons. Nearly all pregnant women who availed themselves are attended to by skilled health professional. A South African PMTCT study revealed that overall, 92% of women received at least one antenatal care visit (91% of urban women and 93% of rural women), though more 50% received care after the fourth month of pregnancy. Though 91% were supported by a skilled attendant at delivery some disparities in utilisation exist: 94% of urban women received this form of support, while on 85% of rural women did not (UNICEF, 2011). In brief, the study revealed that pregnant women are less motivated to utilise health services and those that attend present themselves in advanced pregnancy. The study also paints a picture that rural pregnant women are disadvantaged compared to well resourced urban health facilities.

Public health resources are under-utilised; ARTS access and PMTCT have improved but a lot needs to be done in resourcing poor settings. Lemens (2010) states that over one-third of HIV-infected pregnant women and half of their infants do not get any treatment; the contributory factors range from high HIV transmission rates, poor infant feeding practices and poverty.

A study conducted in Nairobi, Kenya women were encouraged to bring their male partners for HIV prevention counselling and testing. Out of a total of 510 HIV-infected women enrolled, a total of 10% (54) were lost to follow up before delivery (27) or did not report the current male partnership (27). Boniphace (2009) fully accepted the PMTCT challenges identified that affected the effectiveness of the programme, these challenges included poor male partner involvement, low uptake of ARV prophylaxis and poor community participation or bad support.

The researcher has worked in ANC for several years and has witnessed various barriers of PMTCT implementation and bears testimony that PMTCT programme can be delayed due to financial constraints, lack of motivation from both patients and health providers, increased demand for PMTCT programme, limited available resources (both staff and equipment), lack of knowledge and skills, stigma and discrimination attached to HIV/AIDS. African pregnant women attended the ANC clinic alone without their partners, and when issued with medication to protect the baby from HIV, partners were not there to remind the pregnant women and the role of a male remained obscure, in brief, pregnant women appeared lonely, requiring more support.

Most African countries are poor and have uneven distribution and infrastructural inadequacies of existing PMTCT services make them ineffective and unattractive to many intended beneficiaries. Access to PMTCT services and community remain low (Onyango, 2008). The reality is that women in Sub-Saharan Africa continue to infect their children during and post delivery and, care available is substandard.

Based on the researcher's experience and prolific input of Relf et al (2011), barriers of effective PMTCT implementation range from, poor working conditions, low remuneration packages leading to staff shortages, risk of occupational transmission and stress of work load in communities devastated by the epidemic drive up rates of attrition. PMTCT programme is adding a workload on an already strained health system. PMTCT requires more time and follow up. In brief, there is a worldwide gross shortage of trained health personnel to implement effective health programmes. According to Relf et al (2011), 1.4 million health care workers, specifically, 720 000 physicians and 670 000 nurses are required for effective execution of PMTCT programme.

Knowledge is power; knowledgeable health professionals render health services in a more efficient and speedy rate. PMTCT programme is complex and requires formal training. A study conducted in Haiti revealed shocking aspects on nursing curriculum, revealed that nurses in Haiti receive insufficient training with regard to HIV/AIDS of the population and yet HIV/AIDS in Haiti is 2.2% approximately 10 000 people were on ART. The country (Haiti) has a gross shortage of doctors and local nurses with their poor training on HIV/AIDS are the sole providers of PMTCT services (Knebel, Prismy, Devirois, Meejour, Lemaire et al (2008).

HIV/AIDS is extremely prevalent in Sub-Saharan Africa. The cultural/traditional beliefs in Africa deprive HIV positive pregnant women to share openly their feelings instead women are expected to be strong home pillars that support both immediate family members and in-laws. Women still have limited rights in making informed choices on sexuality and child bearing and do not even have money to collect treatment, access competent ANC and post natal care services and are compelled by in-laws to feed using both breast milk and artificial feeds thus exposing infants to HIV/AIDS (Onyango, 2008).

The demand for HIV/AIDS services is extremely high in poor countries especially the Southern African region where almost 30% of all babies born to HIV positive mothers acquire the virus, half a million children are infected with HIV every year. Some poor African states like Zimbabwe have no PMTCT services or are inefficient and women do not bother to utilise such services while other women have fear of stigmatisation (Onyango, 2008).

The African PMTCT main challenges range from over emphasis on HIV infected women, poor communication between spouses, men refusing ANC attendance, testing and not complying with PMTCT recommendations (Health Bridge, 2011). NVP is given on the onset of labour and every three hours until delivery DOH (2010), however, according to Health Bridge (2011), women attend ANC but many deliver at home and it is difficult to ensure that drugs provided were taken which exposes innocent infants to HIV/AIDS. Cameroon ANC prevalence of HIV was 8.7%, clearly HIV positive women are not closely followed and even themselves have, no full understanding of the importance of ANC, PMTCT, and hospital delivery. The prescribed period for NVP syrup, for children of HIV positive mothers is 72 hours and with home deliveries children are brought in late to clinics, most negative tested women do not appear for the second test although instructed to and apparently social support is inadequate.

According to Health Bridge (2011), stigma and discrimination remains high in communities. AIDS is viewed as a death sentence, even worse with poverty, women are willing to formula feed but cannot afford formula while women who cannot afford formula choose breastfeeding to avoid stigmatisation, the rate of formula feeding is extremely low (30% of women who receive PMTCT treatment in Malawi).

Among PMTCT challenges, some countries do not have free testing kits, and many women are not tested. Running out of stock is very common especially in remote rural areas and the rate that NVP syrup runs out is high (Health Bridge, 2009). Barriers of PMTCT come from all angles such as poor reporting which make the statistics incomplete, staff is poorly motivated, poor training for PMTCT implementers and poor in-service education organisations and evident knowledge of the individual, care giver and community.

WHO (2007) identified the following factors as impeding global PMTCT: Biomedical factors where various countries have limitations to identify pregnant women in need of ART, and impact of diverse co-morbidities (TB, hepatitis B, and C, malaria, and anaemia); operational factors such as; limited human resources and infrastructure for PMTCT implementation, low utilisation of maternal, newborn and child health services, weak health care systems, lack of an integrated framework to assist national policy makers, programme managers, local and international partners in gaining country-level efforts for the scale-up of comprehensive PMTCT and paediatric HIV interventions; lack of demonstrated government leadership, commitment and accountability towards the goal of universal access to PMTCT and paediatric HIV care services, weak linkages with HIV care, support and treatment, lack of monitoring, follow up or tracking of women and children post delivery and weak supply management systems, lack of data on impact of PMTCT programmes, lack of technologies for early testing of infants, poor sustainable funding for scaling-up national programmes, and lack of coordination among partners.

Women may face barriers due to their lack of access to and control over resources, child-care responsibilities, restricted mobility and limited decision-making power. Men do not seek HIV services due to fear of stigma and discrimination, losing their jobs and of being perceived as weak or unmanly (WHO, 2008). More males in RSA need to be part of ANC/PMTCT, however, health provider attitudes are stumbling blocks and are worsened by structural constraints that cater for females. As a result males have developed no interest in active support for their pregnant partners during PMTCT sessions (Elizabeth Glaser Paediatric AIDS Foundation, 2010).

The researcher shares a similar notion, South African maternal institutions were built solely for females and have not been modified to accommodate men. There are no male toilets in ANC/PMTCT site, changing rooms are meant for females. The researcher has also observed elements of ostracism of men accompanying their pregnant partners usually Asians and Caucasians. As a result men lack the skills necessary in dealing with HIV in pregnancy due to the attitudes of health providers, and other HIV positive pregnant women towards the few accompanying men (Elizabeth Glaser Paediatric AIDS Foundation, 2010). The ANC/PMTCT site space is limited and demand is extremely high it can barely accommodate current numbers of females and yet no new personnel have been employed to relieve over stretched midwives and to cater for such demand. Active male involvement is clearly an additional workload on the midwives' routine and this on its own as viewed by a researcher has a potential of creating an unfriendly environment for the few men keen to partake in PMTCT programme.

Roles of males in PMTCT: A new frontier

A study conducted in Botswana on the role of men in PMTCT reveals promising results that can improve PMTCT implementation, preventing HIV/AIDS transmission to the infant, improving attitudes and behaviour if both parents are actively involved in PMTCT (AED, 2009). It is plausible that, disclosing one's HIV status can be emotionally taxing and comes with fears of rejection by a partner, whereas if testing together, discovery of each others status will make life easier and both can receive counselling on coping mechanisms.

AED (2009) prescribes a comprehensive approach to PMTCT and believes that all stakeholders must be actively involved in PMTCT programme implementation; family, male partners and traditional healers ought to be actively involved in pregnancy and be given proper information on PMTCT. AED (2009) further explains the significance of active involvement of these stakeholders to ensure that they do not hold beliefs that impede/contradict PMTCT practices such as opposing exclusive feeding methods on cultural grounds if the woman is infected. Botswana has designed a PMTCT peer man programme to compliment the successful and on-going PMTCT peer mother programme. The PMTCT peer man programme seeks to contribute to improved ARV adherence rates among HIV infected pregnant women and their infants, and access to care for those with AIDS, to increase the number of male partners participating and active in PMTCT programme; to increase the number of male peers trained to provide outreach in target communities, and increase the number of workplaces and homes receiving outreach programmes (AED, 2009).

The impact of male involvement is believed by most researchers to be effective and ensures extended support for a newly HIV diagnosed pregnant woman. Lemens (2010) states that 90% of estimated 1000 children infected daily with HIV live in Sub-Saharan Africa and vertical transmission accounts for approximately 95% of infections in children. Male involvement appears to contribute towards a 40% reduction of vertical transmission and infant mortality.

A study conducted in Mbeya Region in Tanzania concluded that the majority of males support PMTCT interventions. A study included 124 individual interviews and six focus group discussions. The identified barriers to

ANC/PMTCT were lack of knowledge/information, no time, neglected importance, the services representing a female responsibility, or fear of HIV test results (Theuring, Mbezi, Luvanda, Harder, Kunz & Harms, 2009). Only a few men perceived couple HIV counselling/testing as disadvantageous.

Males who participated in the Tanzania-based study by Theuring et al (2009) also reported that they believed PMTCT to be women orientated and they also indicated that the female-partners offered very limited insights into what PMTCT services offered and as such, they did not feel the need to utilise available PMTCT services. As a result males had negative attitudes, and poor knowledge of PMTCT. The findings of this study have been reported by other and it has been asserted that the Tanzanian community continues to stigmatise women infected with HIV/AIDS based on cultural attitudes (Akairo, Deonisia & Sichoma, 2011).

Several studies have been conducted in Tanzania and obstetric researchers in Tanzania have been at the forefront of PMTCT research on service implementation and the accepted viewpoint points to a need to urge males to take an active role in PMTCT. In a Tanzanian study, Boniphace (2009) discovered that 103 (74.6%) from 1238 respondents were not willing to participate in PMTCT programme by accompanying their pregnant partners to ANC and the majority of respondents (61.4%) have never participated in PMTCT interventions. The men had various reasons for not attending ANC with their partners, their reasons ranged from being busy (25, 2%), cultural beliefs (21.4%) and a lack of knowledge on the importance of partaking in PMTCT (21.4%).

The utilised method to involve Zimbabwean men in the prevention of HIV/AIDS was to circumcise them, almost 1.2 million men will be circumcised in Zimbabwe by 2015 (HST, 2011). Elizabeth Glaser Paediatric AIDS foundation (2011) believes that male involvement in PMTCT can significantly impact women's uptake of HIV-related services and adherence to anti-retroviral drug regimens. Most researchers argue that in a traditional context, men have a stronger influence on their female partners' medical care including participation in PMTCT programmes. Men usually dominate the relationship in Sub-Saharan and must be coaxed into full participation in PMTCT and no study in RSA has revealed a strong male participation in PMTCT.

Men are urged to join their pregnant partners in testing for HIV and syphilis in Zambia, a good turnout of males eventually led the Zambian health authorities to complain of the additional strain on health facilities, having limited space and human resources (Elizabeth Glaser Paediatric AIDS foundation, 2011).

A man's presence in a female dominated environment will improve PMTCT programme. Involving men in PMTCT helps to improve gender based violence and HIV risk testing disclosure, and fear of violence strategies for increasing men's involvement. Males are essential in primary prevention of HIV/AIDS among women who are uninfected during pregnancy so that children remain uninfected during and after delivery since most studies revealed that males are more promiscuous than females (Elizabeth Glaser AIDS foundation, 2009).

Males have a special role in PMTCT and must be encouraged to partake in these roles. When a woman discloses her HIV status to a partner they often experience gender based violence and are often blamed for spreading HIV. Yet it was found that men who are actively involved in PMTCT from the onset of pregnancy have a much better understanding of immunological dynamics and strive to protect the baby and the mother from re-infections. According to Elizabeth Glaser AIDS Foundation (2010), men are pre-judged as having negative attitudes and understating the importance of PMTCT and so make little effort to engage men. Kenya has increased partner involvement in PMTCT, the proportion of male partners who used VCT services as a result of being involved in the programme doubled in one site and increased by 50% (Elizabeth Glaser AIDS Foundation, 2010).

Men have an important role to play in pregnancy, and PMTCT programmes in RSA allows men to be tested with their pregnant partners, be given health education to curb the spread of HIV/AIDS (DOH, 2010). The researcher while working in ANC for three years did not witness any men accompanying pregnant women, yet the role of the male is always emphasised in ANC health education. Men may also benefit from PMTCT programme through free testing and counselling, and to be given a better understanding of re-infection and the dangers of unprotected sex with a partner on HAART.

PMTCT at ANC level encourages all pregnant women to book antenatal care, as soon as they believe they are or are confirmed to be pregnant, receive/offered routine ANC including micronutrient supplementation (iron and folate); be offered information on the availability of PMTCT interventions during all health care consultations, be routinely offered HIV counselling and testing and encourage partner or spouse testing, be encouraged to involve partners or spouses in caring for the pregnancy, be counselled on safe sex and provided with condoms, be counselled on safe infant feeding options and assisted in making an appropriate feeding choice, be supported on the choice of infant feeding at all times, be clinically staged and have their CD4 cell count taken, and preferably at the first ANC visit

(or at the earliest opportunity), be screened for TB, in line with the BANC (Basic Antenatal care), be screened and treated for syphilis and other sexual transmitted infections; and be given either prophylaxis or HAART depending on the status and clinical indications, commence lifelong ART within two weeks, if tested positive with more than 350 CD4 cell count at 14 weeks of pregnancy or above, initiate prophylaxis regimen being AZT (Zidovudine, NVP (single dose of Nevirapine and Truvada).

The main aim for antiretroviral prophylaxis regimen is to reduce mother-to-child transmission. All other health ethical principles apply that of confidentiality, respect, fair distribution of resources and client autonomy (DOH, 2010). Fast tracking of pregnant HIV infected women is of paramount importance for the South African National Department of Health. According to DOH (2010), women testing positive at any gestational age must be offered following services and clinically staged promptly.

HIV/AIDS Advancements – Exploring the role played by modern activities

International researchers and media at times do confuse the general public on the advancement in HIV/AIDS, claiming victory of having found the HIV/AIDS cure. The researcher has also observed less educated pregnant women reporting to have been cured of HIV and felt no need of ARTs, leading to multiple drug resistance. A similar study has been reported to WHO (2012) where researchers claimed that hormonal contraceptives prevent and heal HIV/AIDS while other researchers were convinced that hormonal contraceptives create a greater risk of HIV acquisition. WHO (2012) being an international organisation responsible for health matters, called an urgent meeting between 31st January and 1st of February 2012, and deliberated intensely on such hormonal contraceptive matters and concluded in the presence of 75 individuals representing a wide range of international stake holders that women can still continue using hormonal contraceptive to prevent unwanted pregnancy and use condoms to prevent sexually transmitted infections and HIV (WHO, 2012).

There is light at the end of the tunnel. UN (2011) reported that by the end of 2009, 5.25 million people were receiving antiretroviral therapy for HIV/AIDS in low and middle-income countries which represents a jump of over 1.2 million from December 2008, the largest increase ever in one year. Some countries such as Botswana, Cambodia, Croatia, Guyana, Oman, Romania, and Rwanda, have attained universal access (defined as coverage of at least 80% of the population in need) to ART or interventions to prevent MTCT of HIV.

Recently 30 nations met at the cross roads conference, and deliberated on reformed strategies for fighting against HIV/AIDS. According to UNAIDS (2011), RSA President Jacob Zuma felt that HIV/AIDS has claimed innocent lives of millions of South Africans and acknowledged that RSA is suffering from the hardest hit of HIV/AIDS; and has orphaned millions of children. The South African President announced positive efforts made by South Africans against HIV and that HIV/AIDS has stabilised and a decline on prevalence among children and young people has been noted. The President hoped to cut the rate of new HIV infections in half and provide HIV testing to 15 million people and all pregnant mothers. A congratulations goes to RSA for having tested 8.4 million people by May 2011, and hoped to provide life-saving drugs to 80% of South Africans in need (UNAIDS, 2011).

The General Secretary of the United Nations, Mr Ban Ki-Moon announced that globally that the number of people becoming infected and dying of HIV/AIDS is decreasing and called for international resources needed to sustain the progress and felt that the international society still has a long way to go to prevent new HIV infections, end discrimination and attain Zero AIDS-related deaths (UNAIDS, 2011).

PMTCT has not yet served its purpose in RSA and other African States but the manner in which it is presented and prepared, it is indeed clear beyond a reasonable doubt that it has good intentions and if well implemented could bear or yield positive outcomes (WHO, 2008; DOH, 2010; Kunene & Kekana, 2009).

Well-developed or high income countries have accomplished a full functional PMTCT and have managed to eliminate mother-to-child transmission. Gratitude goes to effective voluntary testing and counselling, access to ART, safe delivery practices and widespread availability and safe use of breast milk substitutes. Thousands of children in well developed countries in Europe have been saved from HIV/AIDS (UNAIDS, 2011; WHO, UNAIDS & UNICEF, 2011).

The Researcher shares a similar sentiment of proper contraception of HIV positive women thus preventing unwanted pregnancies, proper prevention of HIV infection among prospective parents and share similar views on ANC clinics to provide intensified HIV testing, other prevention interventions available in services related to sexual health such as antenatal and post-partum care and focusing on preventing HIV in women of child bearing age. Developed countries have opted for caesarean sections to ensure that the child is safe from MTCT especially for mothers with

high levels of HIV in their blood 'increased viral load and this practice is seldom implemented in poor resource settings (WHO, UNAIDS & UNICEF, 2011).

The HIV/AIDS remains an international problem, however, a researcher acknowledges the progress made towards reductions of poverty and social changes post PMTCT and MDGs implementations. According to UN (2011), in Southern Asia, there is still a shortage of quality food, and poor feeding practices, combined with inadequate sanitation has contributed to making underweight prevalence among children from the richest 20% of household decreased by almost half.

The main reason why clinical research is conducted is to explore facts leading to a cure. According to UNAIDS (2011) results of trials announced on the 12th of May 2011 show that if an HIV positive person adheres to an effective ART regimen, the risk of transmitting the virus to their uninfected sexual partner be reduced by 96%.

The community is tirelessly working, striving to ensure that all people test and are fast tracked to HAART to ensure an AIDS free generation. According to UNAIDS (2011), treatment demands have increased, 6.6 million people are on treatment yet nine million are still without ART. The aim is to ensure that all pregnant women living with HIV receive treatment to reduce maternal deaths and end new child infections within five years.

Clearly, from Europe to Africa, HIV in pregnancy is a burden not only to an individual's health status but possesses a tremendous strain on socio-economic, political, and significant other indicators. Globally, there is a forever increasing demand for competent personnel to handle patients on ARTs. Relf et al (2011) acknowledges WHO's (2008) recommendations of increasing personnel in ARTs dispensation and comprehensive training offered to professional nurses to commence HAART and be able to manage related complications and adverse reactions.

Funds have been made available to ensure comprehensive roll out of ARTs and the affected and infected population have been afforded an opportunity to access ARTs and related services free of charge, to save humanity. Almost all South African health institutions render HIV testing and counselling services. Globally, a number of professional nurses have been trained in line with considerable efforts to improve the capacity of nurses to initiate and maintain ART while evaluating its effectiveness, monitoring for adverse reactions, drug to drug interaction reduction, understanding traditional healers interventions, promoting adherence to therapies and providing management of clinical manifestations (Relf et al, 2011).

In Botswana, Brazil and other developed countries PMTCT is fully implemented and functional to serve the purpose of saving mothers and children. In developed countries, almost all HIV infected women receive good PMTCT services, with the best treatment and formula feeding, research has affirmed that chances of transmission is less than 2% in these developed countries (Onyango, 2008).

Southern Africa is badly affected by HIV/AIDS and it is impressive to learn that in Sub-Saharan African six nursing leaders took an active role in participatory action approach to develop the essential nursing competencies related to HIV/AIDS management (Relf et al, 2011). The devised competencies have a valuable input and serve as a scientific guidance in pre-service education related to HIV/AIDS, to strengthen in-service or capacity building programmes designed for already qualified nurses and to guide policy and regulatory reform in the context task shifting, task sharing and scope of nursing practices .

The basic community health principles emphasise prevention, curative, and rehabilitation (Primary, Secondary and Tertiary) strategies of dealing with an outbreak. Comprehensive prevention programmes require knowledgeable and skilled nurses and community health workers to provide evidence based interventions to prevent new infections while increasing counselling and testing. Critically ill HIV/AIDS patients in their last stage of life require palliative care trained nurses to deliver, co-ordinate, and evaluate interventions that are culturally relevant and sensitive. In brief, PMTCT implementation requires knowledgeable professionals who are well vested with reproductive health and scientific basis of prevention of HIV infection during and after pregnancy (Relf et al, 2011).

Based on the South African health infrastructure, RSA has many building blocks needed for a functioning health care system. RSA is internationally recognised, it is the only African state in G20 and globally regarded as having unrivalled medical infrastructure and expertise in Africa, and the highest per capita spending on health US dollar 748 in Sub-Saharan Africa. The RSA health documentation is up to standard and clearly indicates the amount used for health personnel, budgetary allocations, and information systems (HRW, 2011). Increasing maternal and infant mortalities and new HIV infections discredit RSA's health system. The RSA has the potential of ensuring an AIDS free generation with the help of academic and scientific research like the current research on PMTCT practices and exploration. RSA stands a better chance of improving the quality of life irrespective of inequalities based on geographical, racial and socio-economic status, access to health care, including maternal health care.

The most recommended method of monitoring effective PMTCT is through collection of current studies for analysis. Keeping prevalence statistics help in epidemic monitoring and necessary adjustment on PMTCT can be made within stipulated period (Johnson, 2009).

In response to a gross shortage of specialised medical practitioners to implement and monitor PMTCT programme, WHO (2008) has recommended a complex strategic plan of task shifting or an international revised scope of practice for professional nurses to counter act gross shortage of physicians and obstetricians by allowing professional nurses/midwives to initiate and monitor HAART to scale up access to ARTs (Knebel, Puttkammer, Demes, Devirois & Primsy, 2008). Delegated task on HAART initiation and monitoring or task shifting has led to nurses being heavily or actively involved in HIV testing and counselling, ART training, ART roll out, patient assessment and fast tracking to HAART, assessing toxicity and treatment failure, comprehensive HIV/AIDS education, referrals to support groups, community mobilisation and co-ordination of awareness campaigns, psychological support and adherence support, record keeping and reporting. The workload for nurses in PMTCT is revised and they have more duties than before, now they are expected to ensure adequate preparatory education, follow up counselling, drug initiations, step up adherence, monitor for adverse reactions and even revise the treatment regimen (Knebel et al, 2008).

Developed countries continue to support scaling up strategies that have proved to work and are excelling in improving the distribution of PMTCT centres, especially with facilitation of the community based organisations that have the capacity to undertake such PMTCT services, improving quality of PMTCT services to move away from 'minimum package' to a comprehensive package, thus drastically reducing chances of MTCT (Onyango, 2008).

Most PMTCT experts strongly believe that HIV positive pregnant mothers must be granted competent PMTCT services, fast tracked into HAART, offered prophylaxis and other drugs for opportunistic infections (DOH, 2010); closely monitored for drug sensitivity, adverse reactions and any other pharmacodynamics, supporting mothers to access alternative feeding opportunities for their babies if they wish, even though this option still remains quite controversial (DOH, 2010; Onyango, 2008).

Summary

The paper as offered a comprehensive review of the current discourse on the prevention of mother to child infection in HIV/AIDS. Within this, a special focus is given to South Africa and modifiable challenges to the effective implementation of programmes of prevention are offered. The review affirms the lack of agreement within previous research about the range of consistent barriers to implementation and equally importantly, the range of interventions that can be effected to improve engagement in prevention programmes.

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