

Mother-to-Child Transmission (MTCT) of Human Immunodeficiency Virus (HIV)

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Abstract: *Mother-to-Child Transmission (MTCT) of Human Immunodeficiency Virus (HIV) is a confirmed source of HIV infection in pediatrics. An estimated 90% of pediatrics acquired HIV infection during pregnancy, labour, delivery and breastfeeding. Generally, HIV/AIDS is one among the global public health problem, that over two decades has continue to constitute a serious threat to the social mental, emotional and physical wellbeing of African mothers and their babies especially in the sub-Saharan African and in Nigeria. More than 60% of all new HIV infections are occurring in women and children, due to the disproportionate burden place on the woman and her child, who may continue to experience high rate of new infection. It is on this note that this paper examined some of the significant hurdles hindering prevention of mother-to-child transmission (PMTCT) in the country such as: Less or non education, unknown status, unplanned pregnancy, socio-cultural factors, Delayed Antenatal Care, Stigma and Discrimination that has created the gaps in PMTCT and its Health Implications such as increase Incidence, Prevalence rate, increase Morbidity and Mortality, Poor efficiency and economic output, and a Uncertain future for the developing countries. The paper suggested that, programme planners of (PMTCT) should take into consideration the individual, family, and societal factor hindering PMTCT for possible acceptance of the programme by all, for successful elimination of MTCT. Services should be made accessible to all women especially those in the rural areas. Strategies that will improve utilization of health services by rural dwellers should be promoted.*

Keywords: *Mother-to-Child, Transmission, Prevention, HIV/AIDS.*

I. Introduction

Nigeria is the most populous country in Africa and ranked the seventh most populous, and 32nd largest country in the world. Nigeria has a total area of 923,768 km², 356,669 sq mi, and located in western Africa on the Gulf of Guinea. [1] Based on the estimation of 2006 national census and an annual growth rate of 3.2% puts the 2012 population at about 171 million [2]. Nigeria has a total of 34,173, health facilities of which 30,098 (88.1%) are Primary Health-Care Facilities, 3,992 (11.7%) secondary and 83 (0.2%) tertiary and 38% of the total facilities belong to the private sector [3]. These facilities are meant to cater for the health needs of the people.

Mother-to-child Transmission of Human immunodeficiency syndrome (HIV) is one of the health needs these facilities are meant to handle. Globally, Nigeria is ranked the second with the highest number of new infections reported each year (Joint United Nation Programme on HIV and AIDS [4]. Their statistics also stated that 1.7 million women were living with HIV with the prevalence rate of 3 percent among young women within 15-24years. An estimated number of 69,400 children acquired HIV in 2011. The pandemic in Nigeria is of enormous magnitude. The above statistics remains a public health problem that must be given priority attention.

The burden of this infection has been placed upon women and children, who continue to witness increase in new infection of HIV and it health related illness and death. Nigeria accounts for 30% of the burden of mother-to-child transmission of HIV (National integrated management of pregnancy and childbirth curriculum [5]. HIV/AIDS among women of child-bearing age and MTCT is still a major public health problem in Nigeria [6].

Nigerian recorded her first case in 1986 in a 13-year-old girl [7]. Since then the pandemic has being on the increase. Surveys of pregnant women in the country recorded persistent high HIV prevalence [8], with variations across the country. The national median sero prevalence was 1.8% in 1991, 3.8% in 1994, 4.5% in 1996, 5.4% in 1998, 5.8% in 2001, 5.0% in 2003, 4.4% in 2005, 4.6% in 2008 and 4.1% in 2010, and 3.4% in 2012 [8]. Some states and their prevalence rate: Lagos, 5.1%, Rivers state, 6.1%, Taraba, 10.5%, FCT, 8.6%, Anambra, 8.7%, Nasarawa, 7.5% just to mention a few [9]. According United Nations Nigeria has the highest number of children acquiring HIV in the world. 60,000 Nigerian children were infected in 2012, higher than that of any other country in the world [10]. In Nigeria, 10 per cent of all HIV infections are as a result of mother-to-child transmission and More than 85,000 infants in Nigeria are at risk of HIV transmission from their mothers every year [11]. While several other, Sub Saharan African countries, like Botswana, Ethiopia, Ghana,

Malawi, Namibia, South Africa, and Zambia have all witnessed a 50 per cent decline in incidence rate of HIV in children, while the United Republic of Tanzania and Zimbabwe- are almost achieving elimination of MTCT [1]. Going by this record Nigeria is still far from the 2015 target of global elimination of MTCT. The question is; why is Nigeria not among the countries that have witnessed 50% decline or the two that have almost achieving elimination of MTCT?

The high prevalence of HIV among women in this region is due to hetero-sexual transmission, and also high prevalence of HIV among women of reproductive age or pregnant women, high total fertility rate, culture of prolonged breast feeding/missed feeding, non-use of modern health facilities for antenatal and delivery [12]. Since 1995, globally more than 350,000 children have avoided HIV infection due to interventions measures. Thousands of children could be protected if interventions measures were available and accessible to all women worldwide [13]. The morbidity and mortality associated with pediatrics HIV infection becomes a thing of concern for the future of any country.

This heavy burden necessitated the government of Nigerian (GON) in 2002, to initiate programs on PMTCT . The government response to MTCT was in line with the global PMTCT strategy that promotes the “Four-Pronged” approach. The effort and commitment of the FMOH has however not translated to effective coverage of the entire population of Nigerian states. This is seen in the estimated result of 2009 and 2012 respectively; where only 12% and 18% of HIV positive pregnant women received ARVs for PMTCT. It is estimated that from the pool of about 228,800 infected pregnant women, 57,000 children were infected through MTCT in 2012, making Nigeria to accounts for 30% of the global PMTCT gap. [14, 15]. The statistic is alarming and worrisome, however, this paper aimed at examining some of the significant hurdles hindering PMTCT in the country and its health implications.

“Mother-to-child transmission of HIV also known as Vertical transmission refers to the situation where an infant of an HIV-infected mother acquires the HIV infection from the mother at one or more of the following stages: Transplacentally in the uterus during pregnancy, perinatally during the process of labor and delivery, and postnatally during breastfeeding”. [16,17]

is the spread of HIV from an infected mother to her child during pregnancy, labour, childbirth, or Breast-feeding [18]. It also “refers to the situation where an infant of an HIV-infected mother acquires the HIV infection from the mother at one or more of the following stages: Transplacentally in the uterus during pregnancy, perinatally during the process of labor and delivery, and postnatally during breastfeeding” [16].

Factors Associated with Increased Risk of Mother-to-Child Transmission of HIV (MTCT)

Factors associated with increased risk of MTCT, is multi-factorial. It could be Viral, maternal, placental, foetal conditions and delivery process or combination of two or more factors. Viral factor; higher viraemia increases the risk of transmission, resistance to anti-retroviral drugs; the risk in transmission with HIV1 is higher than HIV2.

Maternal factors: when there is low CD4 cell count, symptomatic disease, poor nutritional status and presences of sexually transmitted diseases and other genital ulcers during labour and breast-feeding. Any of these or combination increases the risk of MTCT.

Placental risk factors; if there is placental disruption from any cause it increases chances of feto-maternal transfusion (ante partum heamorrhage, intra partum heamorrhage), Chorioamnionitis and placental malaria, any of these factors increasing the risk of MTCT.

Obstetric factors; include: vaginal delivery with higher viral load, invasive obstetric procedures (e.g. external cephalic version, foetal scalp electrodes and foetal blood sampling, instrumental deliveries), premature rupture of membrane four hours and above before delivery, prolonged labour, episiotomy/ genital lacerations and first born of multiple pregnancies.

Foetal factors: it could either be prematurity or foetal genetic characteristics [18].

Prevention of Mother-to-child Transmission of HIV

“Prevention of mother to child transmission (PMTCT) of HIV is a global interventional program initiated by the United Nations Organization to protect the children globally from the scourge of the HIV pandemic”. [19]. Prevention of Mother-to-Child Transmission of HIV also known as prevention of vertical transmission refers to interventions to prevent transmission of HIV from an infected mother to her infant during pregnancy, labour, delivery, and during breast-feeding [8].

PMTCT program was initiated in December 2000 in Nigeria with the inauguration of the PMTCT National Task Team (NTT) that same year. The PMTCT/ NTT were responsible for developing proposal,

framework, guidelines, monitoring and evaluating the PMTCT program. PMTCT services in Nigeria started as a pilot project in July 2002 [4].

The program started in six pilot sites, with one in each geopolitical zones of the country as follows: National Hospital Abuja, Ahmadu Bello University Teaching Hospital Zaria, University of Nigeria Teaching Hospital Enugu, University of Port Harcourt Teaching Hospital Port Harcourt, Lagos University Teaching Hospital Lagos, and University of Maiduguri Teaching Hospital Maiduguri. There were also two additional supporting sites the APIN (AIDS Prevention Initiative Nigeria) in Jos University Teaching Hospital, Jos and University College Hospital, Ibadan in the same year. In 2003 Nnamdi Azikiwe University Teaching Hospital, Nnewi and Aminu Kano Teaching Hospital Kano, were established to serve the same purpose. Since then, there have been progressive increases in PMTCT sites to 250 in 2006, 640 in 2009 and 1,320 by the end of 2012 [12].

A “four-pronged” approach to a comprehensive PMTCT strategy was recommended by the WHO known as: **Core programmatic component** which include: Primary prevention of HIV infection among women of childbearing age, Preventing unintended pregnancies, among women living with HIV, Preventing HIV transmission, from women living with HIV to their infants, Providing appropriate treatment, care, and support to mothers living with HIV and their children and families.

Primary prevention of HIV infection among women of childbearing age: The most effective strategy to prevent MTCT of HIV infection is through creating public awareness and educating people on HIV; its routes of transmission, methods of prevention and its consequences if acquired. Preventing unintended pregnancies, among women living with HIV: For every HIV-infected woman, pregnancy should be planned. Those who desire to get pregnant should first have their viral load reduce to a level below 1000 copies/ml before conception.

Preventing HIV transmission, from women living with HIV to their infants: For an HIV-infected pregnant woman, her infant has 25–45% risk of being infected with HIV either before birth or after birth, without any form of intervention.

Providing appropriate treatment, care, and support to mothers living with HIV and their children and families: This has to do with the administration of ARV drugs to infected woman who needs treatment, nutritional and infant feeding counseling, and family planning support given to her, and her baby given prophylaxis [18].

The recent overall goal is to improved maternal health and child survival, through the provision of comprehensive/ integrated PMTCT services as documented in the 2010-2015 scale-up plans [3]. The scale-up plan includes: To ensure at least 50% reduction in HIV incidence among 15-49 year old women by 2015, 90% reduction in unmet need for family planning among women with HIV by 2015; 90% of all pregnant women have access to quality HIV counseling and testing by 2015; 90% of all HIV positive pregnant women and breastfeeding infant - mother pairs receive ARV prophylaxis by 2015, 90% of all HIV exposed infants have access to Early infant diagnosis services by 2015 and 90% of pregnant women requiring ART for their own health receive life-long ART” [4]. Nigeria lunched this plan in 2011. [18].

Benefits of Prevention of Mother-to-Child Transmission of HIV

PMTCT is one of the most effective HIV preventive measures. It covers both preventive, care and treatment for both the mother and her child. It seeks to eliminate the heavy burden MTCT places on individuals, families, communities, and the country at large. In terms of care and finance, support and stretch of health care system. Thus PMTCT is of importance as it wills benefits the family, mother, infant, community and the health care system.

Benefit of PMTCT to the family:

It improves communication between couples and encourages testing of both partners and other family members. It dissuades stigma and discrimination. It helps the couples to plan for the future. It makes provision for infant feeding

Benefits of PMTCT to the mother:

Infected mothers are identified early. For prompt interventions, to stem the risk of MTCT and enables them to access care and support services. It promotes positive behaviour change and reduces the risks of transmission. It increases dual protection methods of family planning and STI prevention. It helps in personal and financial decision-making.

Benefits of PMTCT to the infant:

It protects the infant from being infected either before birth, during birth or after birth. It promotes early diagnosis and intervention for already expose infants. It improves child health and survival.

Benefits of PMTCT to the communities

It promotes understanding and acceptance of HIV/AIDS epidemic and those infected. It encourages acceptance of practices that reduces incidence of HIV. It helps in reduction of stigma and discrimination. It provides infant feeding support and. It helps the community to Plan for the future.

Benefits of PMTCT to the health care system

It decreases disease burden on the health care system. It gives an opportunity to strengthen the health system [18].

Factors Hindering Preventing of Mother-to-Child Transmission of HIV:

Despite the various preventive measures put in place by Government of Nigeria and other agencies for PMTCT program in Nigeria; there are still series of challenges that are slowing down the success of the program. The attributing factors are: “poor buy-in at the state and local government levels, Weak health systems, Human resource limitations particularly in rural areas and Low utilization of maternal and child health-care services” [20]. High fertility rate, low contraceptive prevalence rate, strong culture of breastfeeding with very low rates of exclusive breast feeding before 6 months, and Non-involvement of the private sector, have also affected the program. [18]. Even where services are available there are still not utilized by some infected women; due to socio-economic and cultural or personal reasons. This includes:

Less or non Formal Education:

Michelle, [21]opined that “women make up two-thirds of the world’s 796 million illiterate adults, putting them at a greater disadvantage for accessing information to protect their health, and the health of their children and Preventing Mother-to-Child Transmission, Minute by Minute.” Education help individual to adopt behaviours that reduce health risk, lower morbidity thereby increasing Life expectancy. Education will influences behavioral change in PMTCT. “Educating all women of childbearing age on how to stay HIV-negative, the risk of HIV transmission from mother-to-child will be significantly reduced. This is reliant not only on national HIV prevention programmes, but on the availability and accessibility of family planning services. Access to family planning is also crucial for HIV-positive women to control their pregnancies and to reduce unplanned pregnancies” [13] .

Unknown Status Prior Conception:

Ones HIV status is very important in preventing transmission of the virus to the potential host. Prior knowledge of one’s status will inform decision making and application of various strategies available for prevention of MTCT. Individual who do not know their status do not planned their pregnancies and places the unborn child at risk [13]. Vertical transmission of HIV is minimal at a viral load of less than 1000 copies/ml [16].

PMTCT begins with the non-pregnant woman. HIV-positive women are able to control their pregnancies and to reduce unplanned pregnancies through family planning [13]. Unfortunately, most HIV-infected women in Nigeria do not know their status, and so do not appreciate the risk of HIV infection to their infants if they become pregnant. [4]. Therefore, routine HIV testing for women is crucial for timely intervention and access to effective antiretroviral therapy, both for the health of HIV-infected mothers and for PMTCT.

Stigma and Discrimination:

With increase knowledge of HIV; stigma/discrimination remains one of the challenges in influencing PMTCT. HIV-related stigma and discrimination exist in all nations, although in differently forms across countries, states, communities, religious groups and individuals.[22] and can lead to social isolation and even lead to withdrawal of support from partners, family and community.

A research conducted by the International Centre for Research on Women (ICRW) discovered that there are a lot of consequences associated with HIV-related stigma such as:

- “Loss of income and livelihood
- Loss of marriage and childbearing options
- Poor care within the health sector
- Withdrawal of care giving in the home
- Loss of hope and feelings of worthlessness
- Loss of reputation”.[22]

Some even experienced blame, violence, abandonment; and lack of confidentiality among healthcare workers. Fear of such prejudice can dissuade them from testing, or from disclosing their HIV status and non acceptance

of PMTCT measures. Stigma not only hinders acceptances of the infection and commencement of treatment, it also interferes with attempts to fight the epidemic globally [23].

Socio-economic and Cultural Factor Hindering PMTCT:

Studies identified various barriers to the implementation of PMTCT of HIV including socio-economic and cultural factors affecting the uptake of HIV Counseling and Testing services [24]. These factors constitute barriers to utilization of PMTCT services and subsequent elimination of MTCT. Culture plays an important role in the acceptance or rejection of recommended preventive measures. Example, some culture determines where a woman delivers and how she breastfeed her baby.

. Therefore, the issue of culture on breastfeeding could be a serious factor hindering the use of PMTCT services; because it is associated with HIV positive status. Many Nigerian customary practices and gender roles prevent women from negotiating for safer sex, or having a greater say in how health plans can protect them from HIV and other health issues like maternal mortality.

Delayed Antenatal Care:

The timing of antenatal care (ANC) is very crucial as it influences diagnosis/appropriate management of HIV infection [25]. Late registration for antenatal care delays the initiation of screening and appropriate PMTCT interventions, thereby increasing in-utero MTCT [26]. To ensure successfully prevent MTCT of HIV; PMTCT and antenatal services must be available and within the reach of every one. Pregnant mothers must access antenatal services early and be retained on PMTCT programmes from beginning to end. However due to interacting factors, many women do not start ANC as when due and keep appointments to the end.

Health Implications of the Hindering factors:

Mother-to-child transmission (MTCT) of HIV remains a major public health problem and continues to account for a substantial proportion of new HIV infections among young children [27]. PMTCT is one of the most important and effective HIV prevention strategies. However, despite increasingly large amounts of funding, for health initiatives programmed. HIV infection rates and prevalence continue to increase in Nigeria; as seen in the literature reviewed of this paper. Despite availability of services to prevent MTCT of HIV, most Nigerian infected women who need these interventions are still not accessing them, due to socio-economic/cultural, health system and operational factors constraining many pregnant women from accessing services or returning for follow up; thereby increasing the risk of vertical transmission of HIV [28]. The consequences are, increase incidence, prevalence rate, morbidity and mortality, poor efficiency and economic output, and an uncertain future for the developing countries. Therefore its calls for urgent and rapid scale-up of the PMTCT services in Nigeria to reach the many women who need these services.

II. Conclusion

The persisting high burden of HIV infected pregnant women and MTCT in the country is an indication of the need for urgent scale-up of the PMTCT program and make the services accessible to all women especially those in the rural areas. It is of importance that individual and societal factors need to be targeted for effective implementation of MTCT. Undiagnosed maternal HIV infection prior to conception, unplanned pregnancies, delays in accessing antenatal care, low levels of education, stigma and discrimination were identified as the most significant individual risk factors hindering prevention of mother-to-child transmission of HIV. While the emphasis has always been on increasing availability of potent antiretroviral regimens, and strengthening health systems. Reducing mother-to-child transmission of HIV in Nigeria will be more effective when emphasis is not just on ARV drugs along, but inclusive of all other factors.

Suggestions

Programme planners of PMTCT should take in to consideration the individual, family, and societal factor hindering PMTCT for possible, acceptance of the programme by all for successful elimination of MTCT. Services should be made accessible to all women especially those in the rural areas. Strategies that will improve utilization of health services by rural dwellers should be promoted and encourage. Health education should be Emphasis, for it furnished individuals with health information's that will influence their attitudes, behaviours, beliefs, and values. And will enable them to make intelligent decisions, to take responsibilities or actions that will improve their health and protect others.

References

- [1]. Tobore, O., (2013). Alarming: Nigeria leads the world in number of children contracting HIV-UN report Premium Times. Retrieved from <http://www.premiumtimesng.com/.../139706-alarming-nigeria-leads-the-world>
- [2]. United Nations Population Fund (2010). State of World Population 2010. New York:

- [3]. Federal ministry of health, (2010). National scale up plan towards elimination of mother-to-child transmission of HIV in Nigeria 2010-2015. Abuja, Nigeria.
- [4]. UNAIDS (2011). Global plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive. Countdown to Zero. Geneva, Switzerland.
- [5]. Federal ministry of health, (2013). National Integrated Management of Pregnancy and Childbirth curriculum (IMPACT).
- [6]. Nkwo P. O., (2012). Prevention of mother to child transmission of Human Immunodeficiency Virus: The Nigerian perspective. *Annals of Medical Sciences Research* 2012 Jan-Jun2(1): 56-65. Medknow Publications .
- [7]. Achalu, E.I., (2088). HIV/AIDS And other Sexually Transmitted Infections: What everyone should know and do. Simarch Nigeria Ltd: Ojo,Lagos
- [8]. Federal Ministry of Health, (2010). National HIV sero-prevalence sentinels survey among pregnant women attending antenatal clinics in Nigeria. Technical Report 2010. Abuja.
- [9]. Federal Ministry of Health (2012), Nigeria Prevention of Prevention of Mother-to- child transmission
- [10]. Punch (2014,Number).Nigeria's high HIV/AIDS Prevalence rate Retrieved from
- [11]. <http://www.punchng.com/editorial/nigerias-high-hiv-aids-prevalence-rate/>
- [12]. UNICEF,(2013).Mother-to-Child transmission of HIV-UNICEF statistics. Retrieved from http://www.mydailynewswatchng.com/?p=320&wpmp_switcher=mobile#sthash.BMDpKcJn.dpuf
- [13]. Federal Ministry of Health Nigeria ,(2013). Update of the PMTCT MIS for 2012: Presentation at the arch 2013 PMTCT task team meeting. Abuja:Nigeria. World Health Organization(2012), World health statistic.
- [14]. UNICEF ,(2010). Mother-to-Child transmission of HIV-UNICEF statistics.
- [15]. Inter-agency Task Team on the Prevention of HIV Infection in pregnant women, Mothers and Children. IATT dashboard for monitoring progress towards elimination of mother-to-child transmission goals. New York: IATT; 2012. Coutsouddis A., Pillay K., Kunhn L., Spooner E., Tsai W.Y., Coovadia H.M.,(2001). Methods of feeding and transmission of HIV 1 from mother to child by 15 month of age: A prospective cohort study. Durban South Africa. *AIDS. Journal of public Medicine*.15:379-87.
- [16]. Petrpolou H, Stratigos A.J, Katsambas A.D., (2006). Human immunodeficiency virus infection and pregnancy. *Clin Dermatol.*;24:536-42.Retrieved 15th December from <http://www.ncbi.nlm.nih.gov/pubmed/17113971>
- [17]. UNAIDS (2005), *AIDS Epidemiology Update*
- [18]. Federal Ministry of Health,(2010). National Guidelines for Prevention of Mother-to-child Transmission (PMTCT) of HIV in Nigeria. Abuja.
- [19]. Agboghoroma C.O., Sagay S.A., Ikechebelu J.I., (2013). Nigerian prevention of mother to child transmission of human immunodeficiency virus program: The journey so far. *Journal HIV Hum Reprod* 2013;1:1-7
- [20]. Michelle Betton (2013). preventing-mother-to-child-transmission-minute-by-minute. Retrieved from: <http://www.unaids.org/en/resources/infographics/20120608/gendereveryminute>.
- [21]. International Centre for Research on Women (ICRW) (2005), ' HIV-related stigma across contexts: common at its core'. Retrieved Dec.15th 2014. From <http://www.icrw.org/publications/common-its-core-hiv-related-stigma-across-context>
- [22]. Egyptian Anti-Stigma Forum (2012) ' Combating hiv/aids related stigma in egypt: Situation Analysis and Advocacy Recommendations'. Retrieved 16th Dec. from http://www.eipr.org/sites/default/files/reports/pdf/stigma-report_en.pdf
- [23]. Chinkonde, J. R, Sundby J. , and Martinson F., (2009). The prevention of mother-to-child HIV transmission pogramme in Lilongwe, Malawi: why do so many women drop out. *Reproductive Health Matters* 2009, **17**(33):143-151.
- [24]. Technau K, Kalk E, Coovadia A, Black V, Pickerill S, Mellins CA, Abrams EJ, Strehlau R, Kuhn L: Timing of maternal HIV testing and uptake of prevention of mother-to-child transmission interventions among women and their infected infants in Johannesburg, South Africa. *J Acquir Immune Defic Syndr* 2014, **65**:e170- 178.Retrievedfrom<http://www.ncbi.nlm.nih.gov/entrez/eutils/elink.fcgi?>
- [25]. Chibwasha C.J., Giganti M.J., Putta N., Mulindwa J., Dorton B.J., Chi BH, Stringer J.S., & Stringer E.M.,(2011). Optimal time on hart for prevention of mother-to-child transmission of HIV. *Journal of Acquir Immune Defic Syndr* 2011, **58**(2):224-228.
- [26]. Luo C., Akwara P., Ngongo N., Doughty P., Gass R., Ekpini R., Crowley S. Hayashi (2005). global progress in PMTCT and paediatric HIV care and treatment in low- and middle- income countries in 2004-2005. *Reproductive Health Matters* 2007, **15**(30):179-189. Retrived from: <http://www.ncbi.nlm.nih.gov/entrez/eutils/elink.fcgi?>
- [27]. Adebola A., Nareen A., Behailu M., and Shiferaw,M. (2012). A Qualitative Study of Barriers toEffectivenessof Interventions to Prevent Mother-to-Child Transmission of HIV in ArbaMinch, Ethiopia. *International Journal of Population Research*. 532154. Retrieved from <http://dx.doi.org/10.1155/2012/532154>