

Review

Environmental challenges of Millennium Development Goals (MDGs) 4, 5 and 6: The roles of midwives in Nigeria

Akin-Otiko, Bridget Omowumi

Nursing Services Division, Room 613, Federal Ministry of Health, Abuja, Nigeria

Accepted 9 May, 2013

With less than five years to the 2015 target set by the United Nations for the achievement of the Millennium Development Goals (MDGs), MDGs 4, 5 and 6 are still far from being achieved. Nigeria has the second highest maternal mortality and eighteenth highest child mortality in the world. Efforts to combat HIV and other diseases have recorded only marginal success. This paper identified environmental issues related to the three MDGs and discussed emerging roles of midwives in Nigeria. Review of pertinent literature was done. The environmental challenges related to MDGs 4, 5, and 6 were identified and the critical professional and social responsibilities of midwives to individuals, families and communities with respect to tackling these challenges were discussed. It is increasingly becoming obvious that midwives in Nigeria need to collaborate and respond within and beyond the clinical settings, to the environmental challenges militating against the achievement of MDGs 4, 5 and 6.

Key words: Midwives, challenges, Millennium Development Goals, Nigeria, environmental.

INTRODUCTION

The Millennium Development Goals (MDGs) became the hub of developmental activities in member countries of the United Nations, following the adoption of the Millennium Declaration by 191 countries in 2000 (United Nations, 2008). Most of the eight millennium development goals (MDGs) are either health or health-related goals (Anyangwe et al., 2006). Goals 4, 5, and 6 are usually described as health goals while 4 and 5 are specifically child and maternal health goals respectively. In line with the Delhi Declaration on Integrated Maternal, Newborn, and Child Health, which recognizes that the health of mother and child is inseparable (WHO/AFRO, 2005), and the fact that midwifery practice, is not limited to the woman, this paper covered environmental issues that have implication for both maternal and child health. Similarly, with the global recognition of the professional

midwife as the ideal skilled attendant for first-level maternal and newborn care (WHO, 2005), and the consequent adoption of the Midwives Service Scheme (MSS) by Nigeria in 2009, as a key strategy to reducing maternal deaths (FGN et al., 2009), the paper focused on the role of professional midwives in tackling these environmental issues.

Some progress have been documented towards achieving the eight MDGs by the target year 2015; however, in sub-Saharan Africa, and Nigeria in particular, the recorded achievements in goals 4, 5, and 6 remain unimpressive (United Nations, 2011). Some of the factors responsible for the slow pace in achieving the health goals are environmental. The environment refers to everything that could positively or negatively affect one's life and activities. Roy (2011) defines environment as 'All

conditions, circumstances, and influences surrounding and affecting the development and behaviour of persons and groups, with particular consideration of mutuality of person and earth resources' (Roy, 2011:132). In the field of public health, man's environment consists of social, biological and physical components. According to Lucas and Gilles (2003), the physical is made up of the non-living components such as air, water, soil etc; the biological consists of the living components such as the plants, animals and micro-organisms; while, the social environment is that which is solely created by man, and includes the social structures, services, as well as human behaviour and determinants of behaviour, such as culture, beliefs, education etc. The physical, biological and social components are interrelated and to a significant extent interdependent.

MDG 4 and the environment

MDG 4 aims *to reduce child mortality* and the target is to 'reduce by two thirds, between 1990 and 2015, the under-five mortality rate'. Most regions of the world already have recorded fifty or more per cent reductions in child mortality, but the same cannot be said of sub-Saharan Africa which has the highest under-five mortality rates (U5MR), and, one in eight children in the region dies before the 5th birthday (United Nations, 2011). More than fifty per cent of these deaths are due to diarrhoea, malaria and pneumonia; expectedly, worse among the poor, and in the rural areas, where the related environmental challenges are greatest (United Nations, 2011). Under-five mortality in Nigeria ranks 18th in the world, though it improved from 212 per 1000 live births in 1990 to 138 in 2009 (UNICEF, 2011). The major causes of under-five deaths in Nigeria are, malaria (24%), pneumonia (20%), diarrhoea (16%), measles, (6%), HIV (5%), and neonatal conditions (26%) (FMOH, 2007).

Air, water and soil pollution, poor housing, and poor sanitary conditions are major environmental factors associated with malaria, pneumonia, and diarrhoea. Only 55.8% of Nigerians have access to improved drinking water sources, and 31.2% to improved sanitary facilities such as sewer connections, septic system connections, pour-flush latrines, ventilated improved pit latrines, pit latrines with a slab or covered pit (NPC & ICF Macro, 2009). Studies show that respiratory conditions including pneumonia and asthma are higher among children carried on their mothers' back while cooking with coal and biomass such as wood, charcoal, animal dung, crop wastes (Chauhan and Johnston, 2003; von Schirnding et al., 2002). Only a few of affected children get appropriate care for pneumonia and diarrhoea (UNICEF, 2011). After receiving due treatment, the children continue to live in the unfavourable environments where, their continuous exposure to the pollutants, and their immature immune systems (Rehfuess et al., 2006) increase their risk of

dying before their 5th birthday. Neonatal conditions accounted for over a quarter of the under-five deaths in Nigeria (FMOH, 2007). Authors maintained that exposure to air pollution in pregnancy was related to perinatal mortality and low birth weight (Rehfuess et al., 2006). The use of coal and biomass has been consistently implicated in low birth weights, still births and neonatal deaths, especially in the first week of life (von Schirnding et al., 2002). Ritz and Yu (1999) found out over a decade ago, that exposure to high levels of carbon monoxide in the last trimester was associated with high risk for low birth weight. Today, the level of air pollution is probably higher, with increased green house gasses, climate change and global warming. There is increased vehicular movements, use of household power generating sets by individuals and small scale industrialists, illegal mining activities as in the case of over seventy children killed in northern Nigeria during the lead poisoning crisis of 2009/2010, and unhealthy farming and cooking practices. Salam et al. (2004) reported strong association between early-life asthma and exposure to wood/oil smoke, soot or exhaust, pesticide, herbicide, farm environment in the first year, and with early day care attendance in the first four months of life. Use of coal and biomass within closed kitchens as in modern houses today, increases indoor air pollution and the risk of children (especially the one always with the mother while cooking) to acute respiratory diseases (Smith-Sivertsen et al., 2009).

Improper or delayed care, which is related to social environmental factors, contribute to the morbidity and mortality of children (Abdulraheem and Parakoyi, 2009). Seventy-four per cent of the neonatal deaths in Nigeria occur in the first week of life and is strongly related to delivery practices, care of the newborn, delay in accessing care (FMOH, 2007), and location – urban or rural / the geopolitical zone. Birth asphyxia 25.6%, severe infections 23.1%, preterm birth 23.4%, tetanus 10.3%, congenital abnormalities 6.5%, diarrhoeal diseases 3.9% and others 7.2% (FMOH, 2007) account for neonatal deaths in Nigeria, and they are mostly avoidable and/or preventable (FMOH et al., 2006) with good health and health-seeking behaviour, and improved standard of living.

MDG 5 and the environment

MDG 5 aims *to improve maternal health*, and the targets include, to 'reduce by three quarters, between 1990 and 2015, the maternal mortality ratio' and to 'achieve, by 2015, universal access to reproductive health'. Maternal mortality ratio remains unacceptably high and worse in sub-Saharan Africa. The region accounted for 87% of the global maternal deaths burden, and had only 26% reduction in maternal deaths since 1990 (United Nations, 2011), against the targeted 66.7% (two-thirds) in 2015. The direct causes of the deaths are obstetric

haemorrhage, eclampsia, sepsis and complications of unsafe abortion. The indirect causes include, malaria, HIV, high parity, poor level of maternal education, maternal age, and gender discrimination (United Nations, 2011).

Nigeria has the second highest maternal mortality ratio in the world (FMOH, 2005a). In Nigeria, haemorrhages account for 23% of the maternal deaths, infections 17%, toxemia / eclampsia /hypertension 11%, unsafe abortion 11%, obstructed labour 11%, malaria 11%, anaemia 11% and other causes including HIV/AIDS constitute the remaining 5% (FMOH, 2007). The current maternal mortality ratio, is put at 545 per 100,000 live births (NPC & ICF Macro, 2009), the adjusted ratio was 840 / 100,000 live births, and the lifetime risk of maternal death is 1 in 23 (UNICEF, 2011). Variations within the geopolitical zones showed that it is worse in the northern parts of the country than in the south; though, no accurate data exists presently, a decade ago, it was as high as 1,549 / 100,000 live births in the North East Zone compared to 165 / 100,000 live births in the South West (FMOH, 2007). Antenatal clinic attendance by pregnant women for the required four times remains poor, fewer number of women utilized the services of skilled attendants at delivery, teenage pregnancy remains a problem and access to family planning is still very poor (NPC & ICF Macro, 2009; UNICEF, 2011). Social environmental factors such as, poverty, low level of maternal education, harmful traditional delivery practices, preference for unskilled attendants at delivery, discrimination against women in decision-making processes in the family, child marriage, 'teenage girls baby making factory syndrome', and a host of social vices increase the risk of maternal morbidity and consequent mortality (FMOH, 2005b).

Furthermore, women in developing countries including Nigeria, who depend on coal and biomass for fuel and are responsible for preparing family meals, are at higher risk of exposure to indoor air pollutants from these fuel (Bruce et al., 2002). According to Rehfuess et al. (2006), women exposed to indoor smoke were 3.2 times more likely to suffer from chronic obstructive pulmonary disease (COPD), such as chronic bronchitis and emphysema, than women who cook and heat with electricity, gas, or other cleaner fuels. Poor women, and women in the rural areas, are more likely to use coal and biomass for domestic cooking and heating, thereby increasing their exposure to polluted air and consequently to COPD (Díaz et al., 2007; Smith-Sivertsen et al., 2009), lung cancer in non-smoking women (Behera and Balamugesh, 2005), and cardiovascular disorders (Miller et al., 2007) which are risk factors in maternal outcomes. According to Dasgupta et al. (2006), the poorest and the least-educated households in their study had twice the pollution levels of relatively high-income households with highly educated adults. Living within 100 m from a busy road has also been implicated in COPD in women (Schikowski et al.,

2005). This is critical in Nigeria where women's exposure time is probably increased through the use of motor bikes for transportation, frequent 'hold up' in traffic, and roadside trading / food vending. Previously, fewer women in developing countries smoked tobacco; however, with modernization, increasing number of women and girls smoke, compromising their respiration (Rehfuess et al., 2006) and predisposing them to unfavourable perinatal outcomes.

Climate change, oil-related air and water pollution (Amnesty International, 2009), environmental degradation and depletion of natural resources (Denton, 2002), have been associated with damage to means of livelihood of women who depend on the ecosystem for survival, worsening their impoverished status, and increasing risk of poor maternal outcomes (Denton, 2002). Amnesty International researchers warned that pregnant women were more likely to be affected by the air pollution resulting from gas flaring (Amnesty International, 2009) as in the Niger Delta region of Nigeria. Poor housing, inadequate water supply and absence of basic sanitation among the poor and those living in rural areas (United Nations, 2011) are also risk factors. Women and children are most affected by internal displacement and 'environmental refugee' problems.

Early pregnancy is an established risk factor in maternal mortality (FMOH et al., 2006; UNICEF, 2011). Child marriage is a social phenomenon that threatens maternal health physically, mentally and socially. In 2000 to 2009, twenty-two and fifty percent of women aged 20 to 24 in the urban and rural areas of Nigeria respectively, were married or in union before they were 18 years, and 28% gave birth before age 18 (UNICEF, 2011).

Despite increasing evidences of relationship between gender discrimination and maternal mortality, women still lack decision-making power in matters affecting their health. Studies show that in most communities in developing countries and particularly among the poor, the uneducated and rural, the voice of the woman is not respected in reproductive health matters (UNICEF, 2011). Forty-three percent of women aged 15 to 49 years old in 2002 to 2009 still considered a husband to be justified in hitting or beating his wife for at least one reason or the other (UNICEF, 2011). Women are at higher risk than their male counterparts, to be sexually active and abused in adolescence, yet, they are less likely to negotiate their protection against sexually transmitted infection and / or unwanted pregnancies (UNICEF, 2011). Unmarried pregnant adolescents are culturally unacceptable and discriminated against, causing them to procure abortion, oftentimes, from unskilled providers (UNICEF, 2011), increasing the risk of maternal deaths from unsafe abortions (F.M.O.H., 2007). Efficient family planning services could impact positively on high parity, birth intervals and maternal age which are risk factors in maternal mortality, yet, many women who require and desperately desire the services have no

access to them (Akin-Otiko, 2011). The percentage of women in Nigeria utilizing family planning methods rose from 6% in 1990 to 14.6% in 2008 (NPC & ICF Macro, 2009), but this is a far cry from the expected universal access target.

The poor health-seeking behaviour of women has been blamed for majority of the avoidable undesirable perinatal outcomes (Ozumba and Nwogu-Ikojo, 2008). The recent Nigeria's demographic health survey 2008 (NPC & ICF Macro, 2009), showed that out of the 33,385 women aged 15 to 49, in the country who took part in the survey, 73.7% gave at least one reason for not accessing appropriate care. Some of the reasons given by the women included getting money to pay for treatment (56.4%), the long distance to health facility (36.2%), having to take transport (34.0%), the lack of drugs in the facility (41.3%), the absence of a female provider at the health facility (20.5%), getting permission from the spouse to go for treatment (13.6%), and 17.2% said they did not want to go to the health facility alone (NPC & ICF Macro, 2009:138). Government has free maternal and child health (MCH) care policies, but, the drugs, supplies, equipment and personnel to support the scheme and encourage utilization are lacking (FMOH, 2007).

MDG 6 and the environment

MDG 6 aims to combat HIV / AIDS, malaria and other diseases. Two of the targets of the goal are to 'have halted by 2015 and begun to reverse the spread of HIV/AIDS' and to 'have halted by 2015 and begun to reverse the incidence of malaria and other major diseases'. Significant drop in the incidence of HIV was recorded in sub-Saharan Africa, where 91% of pregnant women living with HIV resides, however, only 53% of these are protected against mother-to-child transmission of HIV (United Nations, 2011). Five per cent of under-five mortality in Nigeria is due to HIV yet the comprehensive knowledge of HIV is very poor especially among the adolescents. Comprehensive knowledge of HIV is only about 52% among Nigerian women aged 14 to 49 compared to 70% among their male counterparts (United Nations, 2011). The percentage of adolescents aged 15 to 19 who had comprehensive knowledge of HIV in 2005 to 2009 was only 28% (male) and 20% (female) (UNICEF, 2011).

The risk of HIV infection is considerably higher among adolescent girls than adolescent boys (UNICEF, 2011). Girls who are trafficked serve as hawkers, domestic servants, 'baby factory' for infertile couples, commercial sex workers etc. These social injustices increase their risk of contracting HIV. It is pertinent to report that delivery and waste disposal practices by health care providers in most health facilities expose users of the facilities and non-users in the neighbourhood to biological pollutants and HIV in particular. Only 16.9% of women of

childbearing age in Nigeria have ever been tested for HIV (NPC & ICF Macro, 2009) and some of these were not informed of their status post-test. Babies of positive mothers who were not informed of their status antenatally, and were not taken through the prevention of mother to child transmission (PMTCT) programmes, are at risk of infection and eventual death. The enabling environment to promote compliance with universal precaution is often absent especially in public and first-level rural health facilities (FMOH, 2007), exposing women and providers to risk of infection. Midwives at first level facilities expressed lack of knowledge of the concept of universal precaution and skills to provide PMTCT services (Akin-Otiko, 2011).

Malaria is a major indirect cause of maternal mortality in Nigeria (11%) and of under-five mortality (24%). Malaria, although caused by Plasmodium, is largely perpetuated by health behaviour factors, such as, bad sanitation, failure to use insecticide treated net (ITN) and prophylaxis. Use of insecticide treated net (ITN) is considered the most cost effective strategy to prevent malaria in endemic areas and it is the main preventive method adopted by Nigeria (NPC & ICF Macro, 2009); however, only 5% of pregnant women sleep under an ITN and only 44% of pregnant women in households with ITN sleep under it (NPC & ICF Macro, 2009). Less than 50% of pregnant women attend antenatal clinic for the required four times. Poor attendance at antenatal clinics reduces the chances of pregnant women accessing required doses of prophylaxis; delayed and improper treatment contributes to high mortality from malaria.

ROLES OF MIDWIVES IN NIGERIA

Sincere, committed and concerned Nigerians, who know what to do, and are willing to be part of it, should get involved and take the lead (McPherson, 2001) in the fight against environmental menace threatening the health of mothers and children. It is believed that midwives could be motivated when they have an understanding of their vital role (CHANGE, 2005). In Nigeria, professional midwives are those who have successfully completed a recognized training programme in midwifery and have been registered as midwives by the Nursing and Midwifery Council of Nigeria (Fraser et al., 2006; N&MCN, 2004; WHO et al., 2004), to take care of women throughout their various life cycles and of children up to age five years. Midwives are trained to assist clients to adapt to their dynamic environment or adapt their environment to meet their needs. Effective adaptation leads to optimum level of functioning (OLOF) and improved quality of life (Roy, 2011). Client education and counselling is an important part of maternal health services through pregnancy, child birth and postpartum period, to provide appropriate information, and help pregnant women and their families take appropriate

actions to ensure the health of mother and baby (WHO, 2006).

According to Guy Stuart's axiomatic statements, 'All behaviours are health related' and 'There can be no ultimate control of any disease or health problem whose aetiology is well defined without addressing the associated behavioural patterns involved'. All stakeholders in maternal, newborn, and child health (MNCH) services require some form of behaviour change or the other (Middlestadt et al., 2003) – knowledge, attitudes, skills and practices. Behaviour change strategies are essential components of a complete package for maternal, newborn and child health (FMOH et al., 2005). According to the World Bank (2006), health promotion and communication strategies have made significant impact on maternal newborn and child health at provider and consumer levels. To reduce maternal, newborn and child mortality rates successfully in Nigeria, related behavioural patterns among the providers of care, the women, the men and the entire community must be reviewed and attended to (FMOH, 2005b; FMOH et al., 2005).

The 'Big 5' – Globalisation (collaboration); listening to women and their partners (effective communication); continuum of care (expanded roles beyond health care facilities); strengthening midwives and midwifery (education, research and practice); and culture, society and tradition (people oriented and context relevant / specific practice) constituted the focus of the 2011 International Confederation of Midwives' 29th Triennial Congress (ICM, 2011). These five areas are fundamental to strategizing against environmental factors militating against the achievement of MDGs 4, 5 and 6. The key roles of midwives discussed in this paper include to: Acquire relevant knowledge and effective communication skills; Collaborate with other stakeholders; Motivate others through modelling; Maintain highest possible standard of clinical practice; and Exhibit Innovate Behaviour.

Acquisition of relevant knowledge and effective communication skills

The first role of the midwife is to acquire knowledge about environmental health (Sattler, 2002) and to continue to acquire knowledge about contemporary issues that could enhance her practice, and promote her clients' health in various settings. Even where midwives had been taught pre-service, the world is dynamic, and environmental matters are also dynamic, they must continually be re-trained (Bradshaw et al., 2008; FMOH et al., 2005) to meet the contemporary standards. To be able to provide relevant information, midwives need access to evidence-based, correct and up-to-date information on the core messages they are expected to share with their clients (Waisbord and Larson, 2005; WHO, 2008). It is part of

the professional responsibilities of midwives to remain current on MNCH issues, to acquire knowledge and improve their skills (WHO et al., 2004). Midwives require a functional knowledge of their clients' behaviour so that they can respond appropriately and acceptably to the need of their clients for information and support (Ratanawongsa et al., 2011; Reitmanova and Gustafson, 2008).

Midwives may be aware of their clients' need for health promotion or education on safe environment but lack the essential competencies to meet the need, hence, their own need to develop effective communication skills (Al-Motlaq et al., 2010). Over the years, several studies across developed and developing regions of the world have shown that health workers lack required fundamental interpersonal communication and counselling (IPCC) skills to communicate appropriate and correct messages that could facilitate behaviour change by consumers, and therefore should be trained (Casey, 2007; de Negri et al., 2005; Hoving et al., 2010; Rowan, 2008; Senarath et al., 2006; Waisbord and Larson, 2005; WHO, 2008). According to Haruna et al. (2010), nurse-midwives had difficulties finding effective ways to advise women on lifestyle related issues because they were not adequately prepared in school and the textbooks did not provide what they needed for their daily experiences with women. Whitehead (2001) observed that nurses were more of traditional 'health educationists' than 'health promotionists', and needed assistance to perform their behaviour change communication functions in a result oriented manner.

Midwives and nurses are the women's choice for correct and up-to-date information (Devine et al., 2008) on all health matters (UNFPA and ICM, 2008) especially at the first level facilities. Midwives being the preferred primary level provider of MNCH care services (WHO, 2008) therefore, have unique roles to play in promoting environmental safety behaviours that support maternal and child health, and that could lead to reduction in the morbidity and mortality rates. It has been demonstrated that health workers' skills respond positively to well-planned and context-relevant training (de Negri et al., 2005; Ratanawongsa et al., 2011), with significant positive client outcomes (de Negri et al., 2005).

Collaboration with other stakeholders

Collaboration is fundamental to midwifery and is therefore the second role considered in this paper. Midwifery is an open system that is responsive to the needs of the consumers of its services, and maximizes community resources to achieve the ultimate good of all. It is therefore important, that midwives appreciate the role of every stakeholder in the wider community and maximize them, including the capabilities of their clients (Ansari et al., 2002). Midwives also need to be able to recognize

and utilize available legal, environmental, and managerial supports to enhance the well-being of all (UNFPA & ICM, 2008). According to Seidel (2005), midwives need to appreciate data and know how to use data effectively to motivate and gain support of, and/or, for their consumers. Major environmental studies and projects require multi-sectoral input; midwives could collaborate with others in such areas. They could participate in sensitization campaigns, walks, debates, and capacity building programmes organized by government, non-governmental organizations and social groups to create awareness on dangers of unsafe environments to mothers, children and all, and how to prevent such hazards.

Motivating others through modelling

Midwives' sphere of influence is quite wide if adequately explored; this, many professionals may not have realized or optimized. One of the priority steps to change the behaviour of mothers for favourable maternal and child health outcomes is to change the behaviour of midwives. Midwives must examine their values; understand their own behaviours and the implication of these, to enable them develop appropriate attitudes and coping strategies in favour of client-oriented professional practice (CHANGE, 2005; WHO, 2008). As influential members of the community and preferred professionals for maternal and child health issues, midwives' attitude, practices and general lifestyles are emulated by family members, neighbours etc. and they often express disappointment with midwives when their behaviour fall short of the expectation of the people. Midwives should maintain healthy physical, biological and social environment as models for others to follow at home and everywhere.

Maintaining highest possible standard of clinical practice

At the First International Forum of Midwifery in the Community, it was concluded that all midwives, must function in an enabling environment (UNFPA et al., 2006). For effective behaviour change, client education and counselling must be supported by an enabling environment. According to de Negri et al. (2005), clients cannot effect lifestyle changes or comply with treatment if they cannot access drugs, essential supplies and services being promoted. Midwives do not provide the drugs and supplies, however, available services could be reorganized where midwives demonstrate adequate understanding and appreciation of clients' culture and preferences (Schooley et al., 2009; Waisbord and Larson, 2005; WHO, 2008), and where a reorganization is indicated, particularly in midwife led facilities. For example, rather than sending clients away or scolding

them for not coming early or missing an appointment, midwives should attend to clients who come outside scheduled clinic days/time due to any of the earlier mentioned reasons for not accessing care. Furthermore, sanitation, water supply, and delivery practices in the facilities should be safe for clients and staff. Adolescent reproductive health is one of the three priority areas in Nigeria's reproductive health behaviour change communication policy (FMOH et al., 2005), therefore, adolescents should not be discriminated against, rather adolescent friendly services should be encouraged in all facilities (UNICEF, 2011). Where information, education and counselling materials were provided, professionals used them and saw them as useful reminders in improving their interaction with the clients (de Negri et al., 2005; Devine et al., 2008). It is important however, that in facilities where messages and job aids are available for client education and counselling, midwives should ensure that the content is correct and suitable for the audience.

Exhibition of innovative behaviour

Pettersson et al. (2006) indicated the need for midwives to change their perception of themselves as victims of unfavourable circumstances, to one of seeing themselves as people who can make a difference and take appropriate actions to do so. Knol and van Linge (2009) also expressed the critical need for nurses to develop 'Innovative behaviour'. They explained that innovative behaviour involves recognition of problems, generation of ideas, mobilization of support, and realization of ideas (Knol and van Linge, 2009). Midwives could initiate actions to protect women and children from the environmental problems discussed in this paper. Studies favour cleaner fuel improved ventilation (von Schirnding et al., 2002), functional free health services for mother and child, effective strategies for distribution of insecticide treated nets, antiretroviral drugs, family planning commodities and services (Sachs and McArthur, 2005), and active involvement of women in all environmental interventions (Arend and Lowman, 2011). Midwives could initiate actions to ensure that women are not only empowered but that the empowerment strategies are safe for mothers and their children. Midwives could also advocate that government and other providers of health care should demonstrate greater commitment to the health sector. For example, advocating for the speedy passage of the National Health Bill to ensure adequate funding and maintenance of the sector for quality maternal and child care. Other possible actions include advocating for the use of environmentally preferable products (Sattler, 2002) and starting a community-based club to promote environmental safety. Innovations must be appropriate to the specific context considering everyone to be affected by it (Couillet et al., 2007). Occasionally, however, innovative midwives are

discouraged by colleagues (Martin and Bull, 2005), but, achievers do not give up on the course they believe in.

CONCLUSION

The gaps in achieving MDGs 4, 5, and 6 in Nigeria are obvious and enormous. Midwives play critical roles in maternal and child health; therefore they can make a difference in their various spheres of influence. It is our responsibility to make the environment safe. Let us do it, and do it well.

REFERENCES

- Abdulraheem IS, Parakoyi DB (2009). Factors Affecting Mothers' Healthcare-Seeking Behaviour for Childhood Illnesses in a Rural Nigerian Setting. *Early Child Dev. Care* 179(5):671-683.
- Akin-Otiko BO (2011). Facilitation Of Behaviour Change Communication Process For Maternal, Newborn, And Child Health At Primary Health Care Level Of Midwifery Practice In Kaduna State. A Thesis Submitted To The School Of Nursing, Faculty Of Health Sciences, University Of Kwazulu-Natal, Durban, South Africa In Fulfillment Of The Requirements For The Award Of The Degree Of Doctor Of Philosophy (Nursing).
- Al-Motlaq M, Mills J, Birks M, Francis K (2010). How nurses address the burden of disease in remote or isolated areas in Queensland. *Int. J. Nurs. Pract* 16:472-477.
- Amnesty International (2009). Nigeria: Petroleum, pollution and poverty in the Niger Delta: Amnesty International Publications International Secretariat Peter Benenson House 1 Easton Street London WC1X 0DW United Kingdom www.amnesty.org.
- Ansari WE, Phillips C, Zwi A (2002). Narrowing the gap between academic professional wisdom and community lay knowledge: perceptions from partnerships. *Pub. Health* 116:151-159.
- Anyangwe SCE, Mtonga C, Chirwa B (2006). Health Inequities, Environmental Insecurity and the Attainment of the Millennium Development Goals in Sub-Saharan Africa: The Case Study of Zambia. *Int. J. Environ. Res. Pub. Health* 3(3):217-227.
- Arend E, Lowman S (2011). Governing climate funds what will work for women?: *Gender Action*
- Behera D, Balamugesh T (2005). Indoor Air Pollution as a Risk Factor for Lung Cancer in Women. *JAPI* 53(March):190-192.
- *Bradshaw D, Chopra M, Kerber K, Lawn J, Moodley J, Pattinson R, Patrick M, Stephen C, Velaphi S (2008). Every Death Counts: Saving the lives of mothers, babies and children in South Africa. Cape Town: Mills Litho.
- Bruce N, Perez-Padilla R, Albalak R (2002). The health effects of indoor air pollution exposure in developing countries: World Health Organization Protection of the Human Environment Geneva 2002 WHO/SDE/OEH/02.05.
- Casey D (2007). Findings from non-participant observational data concerning health promoting nursing practice in the acute hospital setting focusing on generalist nurses. *J. Clin. Nurs.* 16:580-592.
- CHANGE (2005). Maternal Survival: Improving Access to Skilled Care: A Behavior Change Approach. Washington DC: CHANGE/Manoff Group.
- Chauhan AJ, Johnston SL (2003). Air pollution and infection in respiratory illness. *Brit. Med. Bull.* 68:95-112.
- Couillet M, Serhier Z, Tachfoui N, Elrhazi K, Nejari C, Perez F (2007). The use of antenatal services in health centres of Fe's. Morocco. *J. Obstetr. Gynaecol.* 27(7):688-694.
- Dasgupta S, Huq M, Khaliquzzaman M, Pandey K, Wheeler D (2006). Who suffers from indoor air pollution? Evidence from Bangladesh. heapol.oxfordjournals.org Accessed on September 16, 2011.
- de Negri B, Brown LD, Hernández O, Rosenbaum J, Roter D (2005). Improving Interpersonal Communication Between Health Care Providers and Clients - Quality Assurance Methodology Refinement Series Bethesda: http://www.globalhealthcommunication.org/tool_docs/47/gap_improving_interpersonal_communication.
- Denton F (2002). Climate change vulnerability, impacts, and adaptation: Why does gender matter? *Gender Dev.* 10(2):10-20.
- Devine SG, Harrison SL, Buettner PG (2008). Building capacity of maternity staff to discourage the use of sunlight therapy in the post-partum period and infancy. *Women Birth* 21:107-111.
- Díaz E, Bruce N, Pope D, Lie RT, Díaz A, Arana B, Smith KR, Smith-Sivertsen T (2007). Lung function and symptoms among indigenous Mayan women exposed to high levels of indoor air pollution. *Int. J. Tuberc. Lung Dis.* 11(12):1372-1379.
- FMOH (2005a). Handbook On Pregnancy Care and Birth Preparedness. Abuja, Nigeria: Federal Ministry of Health.
- FMOH (2005b). Safe Motherhood In Nigeria: Patterns of Household Practices. Abuja, Nigeria Federal Ministry of Health.
- FMOH, USAID, COMPASS (2006). National Clinical Service Protocol for Obstetric and Neonatal Care. Abuja, Nigeria: Federal Ministry of Health.
- FMOH, WHO, PATHS, UNFPA, UNICEF, DFID. (2005). Behaviour Change Communication Strategy for the National Reproductive Health Policy and framework Nigeria 2005-2008. Abuja, Nigeria: Federal Ministry of Health.
- FMOH (2007). Integrated maternal newborn and child health strategy. Abuja, Nigeria: Federal Ministry of Health.
- FGN, FMOH, NPHCDA (2009). Midwives Service Scheme (MSS) - Accelerating Reduction In Maternal, Newborn And Child Mortality And Morbidity Through Improved Access To Skilled Attendant At Birth. Abuja, Nigeria: Federal Government of Nigeria, Federal Ministry of Health, and National Primary Health Care Development Agency [NPHCDA].
- Fraser DM, Cooper MA, Nolte AGW (Edrs.). (2006). Myles Textbook for Midwives African Edition. Edinburgh: Churchill Livingstone Elsevier.
- Haruna M, Yeo S, Watanabe E, Matsuzaki M, Ota E, Nakayama K, Murashima S (2010). Perceptions of women and health-care providers in Tokyo of appropriate weight gain during pregnancy. *Nurs. Health Sci.* 12:21-26.
- Hoving C, Visser A, Mullen PD, van den Borne B (2010). A history of patient education by health professionals in Europe and North America: From authority to shared decision making education. *Patient Educ. Counsel.* 78:275- 281.
- ICM (2011). Midwives Tackling the 'Big 5' Globally - Congress Programme. Durban, South Africa: ICM 29th Triennial Congress 19-23 June 2011.
- Knol J, van Linge R (2009). Innovative behaviour: the effect of structural and psychological empowerment on nurses. *J. Adv. Nurs.* 65(2):359-370.
- Lucas A, Gilles H (2003). Short Textbook of Public Health Medicine for the Tropics (4th ed.). London: Arnold, Hodder Headline Group.
- Martin CH, Bull P (2005). Measuring Social Influence of a Senior Midwife on Decision-making in Maternity Care: An Experimental Study. *J. Commun. Appl. Soc. Psychol.* 15:120-126.
- McPherson K (2001). For and against Public health does not need to be led by doctors. *BMJ* 322:1593-1596.
- Middlestadt SE, Pareja R, Hernández O, Maguire S, Jimerson A, Randell J (2003). The catalyst behaviour change diagnostic framework: The catalyst Consortium: Academy for Educational Development, Center for Population, Health, and Nutrition, Bureau for Global Programs, U.S. Agency for International Development (USAID)
- Miller KA, David SS, Lianne S, Kristen S, Jeffrey HS, Garnet L. Anderson, Joel DK (2007). Long-Term Exposure to Air Pollution and Incidence of Cardiovascular Events in Women. *New Engl. J. Med.* 356(5):447-458.
- N, MCN (2004). Nursing and Midwifery Council of Nigeria - Basic Midwifery Curriculum For Nigeria Lagos: City Way Printers.
- NPC, ICF Macro (2009). Nigeria Demographic Health Survey 2008. Abuja, Nigeria: National Population Commission (NPC) [Nigeria] and ICF Macro Calverton, Maryland, USA.
- Ozumba BC, Nwogu-Ikojo EE (2008). Avoidable maternal mortality in Enugu, Nigeria. *Public Health* 122:354-360.

- Pettersson KO, Johansson E, Pelembe MDM, Dgedge C, Christensson K (2006). Mozambican Midwives' Views on Barriers to Quality Perinatal Care. *Health Care Women Int.* 27:145-168.
- Ratanawongsa N, Wright SM, Vargo EM, Carrese JA (2011). Challenges in primary care relationships: Seeing it from both sides. *Patient Educ. Counsel.* 85(1):40-45.
- Rehfuess E, Mehta S, Prüss-Üstün A (2006). Assessing Household Solid Fuel Use: Multiple Implications for the Millennium Development Goals. *Environ. Health Perspect.* 114(3):373-378.
- Reitmanova S, Gustafson DL (2008). "They Can't Understand It": Maternity Health and Care Needs of Immigrant Muslim Women in St. John's, Newfoundland. *Matern. Child Health J.* 12:101-111.
- Ritz B, Yu F (1999). The Effect of Ambient Carbon Monoxide on Low Birth Weight among Children Born in Southern California between 1989 and 1993. *Environ. Health Perspect.* 107(1):17-25.
- Rowan KE (2008). Monthly communication skill coaching for healthcare staff. *Patient Educ. Counsel.* 71:402-404.
- Roy C (2011). Roy adaptation model in nursing theories: A framework for professional practice. Jones & Barnett Learning, LLC Chapter 10 pp. 127-142 http://samples.jbpub.com/9781449626013/72376_CH10_Masters.pdf accessed 29th October 2011.
- Sachs JD, McArthur JW (2005). The Millennium Project: A plan for meeting the Millennium Development Goals. *Lancet*, 365:347-353.
- Salam MT, Li Y-F, Langholz B, Gilliland FD (2004). Early-Life Environmental Risk Factors for Asthma: Findings from the Children's Health Study. *Environ. Health Perspect.* 112(6):760-765.
- Sattler B (2002). Environmental Health in the Health Care Setting. ANA Independent Study Modules (March/April). *Am. Nurse* pp. 25-40.
- Schikowski T, Dorothea S, Ulrich R, Ulrike G, Joachim H, H-Erich W, Ursula K (2005). Long-term air pollution exposure and living close to busy roads are associated with COPD in women. *Respir. Res.* 6(152).
- Schooley J, Mundt C, Wagner P, Fullerton J, O'Donnell M (2009). Factors influencing health care-seeking behaviours among Mayan women in Guatemala. *Midwifery* 25:411-421.
- Seidel R (2005). Behavior Change Perspectives and Communication Guidelines on Six Child Survival Interventions: Academy for Educational Development, The Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs and the United Nations Children's Fund. http://www.globalhealthcommunication.org/tool_docs/76/behavior_change_perspectives..._full_text.pdf.
- Senarath U, Fernando DN, Rodrigo I (2006). Factors determining client satisfaction with hospital-based perinatal care in Sri Lanka. *Trop. Med. Int. Health* 11(9):1442-1451.
- Smith-Sivertsen T, Díaz E, Pope D, Lie RT, Díaz A, McCracken J, Bakke P, Arana B, Smith KR, Bruce N (2009). Effect of Reducing Indoor Air Pollution on Women's Respiratory Symptoms and Lung Function: The RESPIRE Randomized Trial, Guatemala. *Am. J. Epidemiol.* 170:211-220.
- The World Bank (2006). Maternal Mortality. Public Health at a Glance from <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTHEALTHNUTRITIONANDPOPULATION/EXTPHAAG/0,,contentMDK:20944136~menuPK:22656916~pagePK:64229817~piPK:64229743~theSitePK:20672263,20944100.html>.
- UNFPA, ICM (2008). Investing in midwives and others with midwifery skills to save the lives of mothers and newborns and improve their health - Policy and programme guidance for countries seeking to scale up midwifery services, especially at the community level: UNFPA-ICM Joint Initiative to support the call for a Decade of Action for Human Resources for Health made at World Health Assembly. http://www.unfpa.org/webdav/site/global/shared/documents/publications/2008/midwives_eng.pdf.
- UNFPA, ICM, WHO, SIDA, IMPACT, FCI (2006). Midwifery in the Community: Lessons Learned: Presented at the 1st International Conference on Midwifery in the Community - A UNFPA-ICM Joint Initiative to support the call for a Decade of Action for Human Resources for Health made at World Health Assembly 2006 Held on 11-15 December 2006. Hammamet, Tunisia.
- UNICEF (2011). THE STATE OF THE WORLD'S CHILDREN 2011 Adolescence An Age of Opportunity: United Nations Children's Fund 3 United Nations Plaza New York, NY 10017, USA.
- United Nations (2008). The Millennium Development Goals Report 2008 - End Poverty 2015 Make it happen: United Nations 2008 http://millenniumindicators.un.org/unsd/mdg/Resources/Static/Products/Progress2008/MDG_Report2008_En.pdf.
- United Nations (2011). The Millennium Development Goals Report 2011. New York: United Nations.
- von Schirnding Y, Bruce N, Smith K, Ballard-Tremere G, Ezzati M, Lvovsky K (2002). Addressing the Impact of Household Energy and Indoor Air Pollution on the Health of the Poor: Implications for Policy Action and Intervention Measures Paper Prepared for the Commission on Macroeconomics and Health. (Working group 5 : Improving Health Outcomes of the Poor): World Health Organization.
- Waisbord S, Larson H (2005). Why Invest in Communication for Immunization? Evidence and Lessons Learned: Retrieved 2nd November 2010 from <http://www.globalhealthcommunication.org/>
- Whitehead D (2001). Health education, behavioural change and social psychology: Nursing's contribution to health promotion? *J. Adv. Nurs.* 34(6):822-832.
- WHO (2005). The World health report – 2005: Make every mother and child count. Geneva, Switzerland: World Health Organization.
- WHO (2006). Consensus on Essential Competencies of Skilled attendant in the African Region. Brazzaville: Report of regional Consultation, 27th February-1st March 2006 Organisation mondiale de la Sante Bureau Regional de l'Afrique.
- WHO (2008). A handbook for building skills Counselling for Maternal and Newborn Health Adaptation Guide. Geneva, Switzerland: The Department of Making Pregnancy Safer (MPS), World Health Organization 2008 http://www.who.int/maternal_child_adolescent/documents/adaptation_guide_counselling_handbook.pdf.
- WHO, ICM, FIGO (2004). Making pregnancy safer: the critical role of the skilled attendant A joint statement by WHO, ICM, FIGO. Geneva: Department of Reproductive Health and Research, World Health Organization.
- WHO/AFRO (2005). The Delhi Declaration on Maternal, Newborn and Child Health - April 9, 2005 Making Pregnancy Safe (MPS) Division of Family and Reproductive Health (DRH) Retrieved 20th April 2009 from <http://www.afro.who.int/index.html>.