

preceding the study, using a check-list. Private hospitals and maternity homes were not included in the exercise as they were not planned to be part of the Enugu State free maternal and child health services for which this baseline assessment was undertaken. Moreover, registered privately-owned hospitals and maternity homes undergo routine yearly assessment as part of their annual accreditation, and acceptable levels of equipment and personnel are key requirements for the facility annual licensure. Yearly student enrolments for the consecutive 5 years prior to the study as well as the staffing levels were also obtained from healthcare pre-service schools located in the state. The present study was restricted to the data on birth attendants from the 208 government-owned PHC facilities included in the assessment.

Inclusion criteria

Only data from PHC clinics managed by local government councils in Enugu State were analyzed in details for the current study. Total number of doctors, midwives/nurses and CHEWs/JCHEWs employed by government-owned tertiary, secondary and PHC facilities were obtained and used only for comparisons. Yearly enrolment data into schools of nursing and midwifery were also obtained for reference purposes only.

Ethical approval

The research ethics committees of Enugu State Ministry of Health granted approval for a larger study as well as for the use of the data for this study.

Data analysis

Descriptive analysis and Students' *t*-test were done

with STATA statistical software (StataCorp LP, Texa USA), and the results were presented in simple proportions and tables. A $P \leq 0.05$ (95% confidence interval) was considered as statistically significant.

Results

Of the 208 government-owned PHC facilities selected for the study, 152 (73.1% i.e., 152/208) were found to provide perinatal care. The remaining 56 were not providing perinatal care. Of the facilities that were not providing perinatal services, 38 were health posts and dispensaries which were not designed to provide perinatal services whereas 18 were health centers with facilities for perinatal care but each was manned by a single male CHEW or JCHEW. Male CHEWs and JCHEWs generally avoided providing perinatal care.

There was no obstetrician or non-obstetrician physician employed in the 152 PHC clinics studied. There were only 55 non-midwife nurses comprising of general nurses and public health nurses and none of them had received competency-based midwifery training according to the ICM recommendations. No PHC facility had more than one of such nurses. The most available cadres of health care providers at the PHC level were the CHEWs and JCHEWs. Table 1 shows the distribution of health workers at the PHC facilities in Enugu state according to Local Government Area of location. Although the mean number of CHEW/JCHEW per facility was 8.1, the actual number ranged from one to 36 per facility. The PHC facilities that were located in the local government headquarters generally had more CHEW/JCHEW than those that were located in the more remote communities. The "headquarter

Table 1: Distribution of PHC facilities and birth attendants according to LGA in Enugu state (2009)

LGA	Number of PHC per LGA	Actual number of nurses per LGA	Mean number of nurse per facility	Expected minimum number of midwives per LGA	Actual number of CHEW/JCHEW per LGA	Mean number of CHEWs/JCHEW per facility
1	5	1	0.21	20	33	6.6
2	8	0	0.00	32	108	13.5
3*	7	3	0.43	28	46	6.6
4*	7	2	0.29	28	57	8.1
5*	4	3	0.75	16	94	23.5
6	11	2	0.18	44	82	7.5
7	14	3	0.21	56	94	6.7
8	12	4	0.33	48	74	6.2
9	8	6	0.75	32	100	12.5
10	11	1	0.09	44	36	3.3
11	8	4	0.5	32	50	6.3
12	6	5	0.83	24	70	11.7
13	11	7	0.64	44	63	5.7
14	11	2	0.18	44	90	8.2
15	11	4	0.36	44	95	8.6
16	8	8	1	32	67	8.4
17	10	0	0	40	74	7.4
Total	152	55	0.36 (0-1)**	608	1233	8.1 (1-36)**

*Urban local government councils, **Range of the number of nurses or CHEWs/JCHEWs per PHC facility. CHEW: Community health extension worker, PHC: Primary health care, LGA: Local government area, JCHEW: Junior community health extension worker

clinics” often offered a wide range of services including antenatal services, management of labor, postnatal services, childhood immunization services, growth monitoring and family planning services among others. They normally opened for business every week day as each of the scheduled services was provided on a particular week day. On the other hand, most of the PHC clinics located in the remote communities opened for business on 1 or 2 week days and combined all their services on the same day or days. Such clinics were typically manned by one or two CHEW or JCHEW.

Table 2 shows the distribution of doctors, midwives/nurses and CHEW/JCHEW according to level of employment. The tertiary level hospitals in Enugu state employed the majority of doctors (92.1%), midwives and nurses (61.3%), followed by the secondary level health facilities. There was not a single doctor working in the entire state public PHC system contrary to state government’s benchmark of one doctor per local government council amounting to a minimum of 17 doctors desired for the 17 local government areas of Enugu State. Similarly, 1390 (61.3%) and 824 (36.3%) of nurses/midwives who were working in the government-owned health facilities in the state were employed by the tertiary level and secondary level health facilities respectively leaving only 55 (2.4%) of the nurses/midwives for the 152 studied PHC level facilities. The 55 nurses represent about 9% of the minimum of 608 midwives required to provide 24 h perinatal services in the 152 PHC clinics that offered perinatal services.

No new birth attendant was employed in the 2 years preceding this study. On the other hand, 29% and 26.7% of the workers left the services of the PHC clinics in 2007 and 2008 respectively through death, retirement, transfer and resignation. Most of those who resigned their appointment from the PHC services were nurses who got employment at the tertiary and secondary level health facilities in the state.

At the time of this study, only the University of Nigeria trained medical doctors in the state with a mean annual student enrolment of 200. The yearly annual enrolment into the schools of nursing and midwifery are shown in Table 3. The accurate yearly enrolment into the schools of health technology could not be obtained.

Discussions

This study revealed very poor availability of SBAs for the

perinatal services in Enugu state public PHC services. Indeed no PHC facility had an SBA that met the WHO/FIGO/ICM definition of SBA.^[3] Therefore the proportion of childbirth assisted by SBA in the PHC clinics in Enugu State was zero percent, far below the WHO minimum benchmark of 23 doctors, midwives and nurses per 10, 1000 population to provide skilled care at birth.^[25] This means that the journey toward achieving the MDG 4 and 5 had not begun in earnest. There were only 55 non-midwife nurses in the 152 PHC centers that provided perinatal services, and no facility had more than one nurse. The irreducible minimum midwifery requirement for 24 h coverage for a facility that provides perinatal services is four midwives. This minimum number provides for three 8 h duty shifts and the night-off period. It does not provide for exigencies and annual leaves. Moreover, it accommodates only one SBA per shift that is sub-optimal. The desired minimum midwifery staffing level should be two midwives per shift and at least one extra midwife to cover exigencies and annual leave periods. This translates to a minimum of seven SBA per facility. By this calculation, no single PHC facility in Enugu state possessed the SBA capacity to provide 24 h safe perinatal services. The poor staffing level of the PHC facilities for perinatal services could have resulted from unwillingness of the local government councils to employ the appropriate cadre of health workers, inability of the councils to pay the appropriate professionals or unwillingness of SBAs to work at the PHC level or a combination of all these. The poly-skilled CHEW/JCHEW are trained to provide a wide range of basic primary healthcare services including health education and promotion, childhood immunization as well as first-line management of childhood and adult illnesses.^[24] These are high-impact services that require minimal investment in capacity development. On the other hand, perinatal care requires more specialized midwifery skills but professional midwifery training does not include acquisition of skills for some of the primary healthcare services that are provided at the PHC clinics. Moreover, the remunerations for midwives and nurses are significantly higher than those of CHEW and JCHEW. Therefore at the current poor funding level of the local government councils, the councils may find it politically more expedient to employ the less expensive but more versatile CHEW/JCHEW to cover more communities and provide a wider range of services than to hire the more specialized and more expensive midwives to improve perinatal services at the PHC clinics.

It is worthy to note that there was no significant difference in the number of nurses per facility between the urban

Table 2: Distribution of health workers in Enugu state according to level of employment (2009)

Category of health worker	Level of employment (%)			
	Tertiary facilities	Secondary and SMOH officials	PHC facilities	Total
Doctor	781 (92.1)	67 (7.9)	0 (0)	848 (100)
Nurse/midwife	1390 (61.3)	824 (36.3)	55 (2.4)	2269 (100)
CHEW/JCHEW	72 (as ward orderlies) (5.5)	0 (0)	1233 (94.5)	1305 (100)
Total	2242	891	1288	4422

CHEW: Community health extension worker, JCHEW: Junior community health extension worker, SMOH: State ministry of health, PHC: Primary health care

Table 3: Yearly student enrolment in preservice nursing/midwifery schools in Enugu state (2005-2009)

Health occupation	Year of enrolment				
	2005	2006	2007	2008	2009
Basic (general) nursing	70	85	80	85	82
Midwifery	48	50	54	60	65
Cardiothoracic nursing	45	45	42	40	48
Ophthalmic nursing	30	35	35	34	36
Public health nursing	40	52	48	52	55

local government areas (mean = 12.7 [9.3]) and rural local government areas (mean = 8.1 [2.8]), $P = 0.11$. As shown in Table 1, the urban local government areas are numbers 3, 4 and 5. Health worker retention is a major challenge all over the world as appropriate remuneration and other forms of motivation are needed to attract and retain adequate staffing level, especially in the rural areas.^[11,14,26] The poor performance of the PHC system in Nigeria has been partly blamed on the ownership/management structure of Nigerian health system where the local government councils have the constitutional responsibility to fund and manage the PHC facilities.^[22] It is doubtful if the average local government council possesses the financial and managerial capacities to provide the recommended optimal staffing level for safe perinatal services at the PHC facilities.^[22] The study however revealed high staffing levels of the PHC facilities with CHEWs. The CHEW is a health worker who is not trained to midwifery proficiency^[4] and therefore is not an SBA. Historically, the CHEWs are country-specific health workers who are trained for PHC provision and have little or no role in the provision of secondary and tertiary level health care services.^[24] For this reason, their employment opportunities are more restricted and hence they are cheaper to hire and retain. Furthermore due to limited job opportunities outside the PHC system, acceptance of rural posting and health worker retention are much higher with the substitute health workers such as CHEWs when compared with the more globally recognized and more mobile health professionals such as doctors, midwives, and nurses.^[16]

As in other countries of the world, general duty nurses in Nigeria are not SBAs because the general nursing curriculum does not provide the requisite proficiency-based midwifery training.^[3,4,24] For a similar reason, non-obstetrician physicians are not SBAs because the basic medical curriculum does not provide proficiency-based midwifery training for doctors.^[3,4] Only obstetricians and midwives in Nigeria meet the international training requirements for skilled birth attendance.^[3,24] However, the general perinatal care skills of doctors, nurses and other health workers could be upgraded to a safe level of proficiency through training.^[26,27]

Available evidence suggests that the midwifery skills of community health workers could be upgraded to a safe level through short in-service trainings.^[16] Evidence from India and Pakistan in Asia^[15,28] as well as from Democratic Republic of Congo and Zambia in Africa^[28] among others,^[29] suggest that

in-service training of non-obstetrician physicians, non-midwife nurses and country-specific health workers in midwifery skills are associated with improved pregnancy outcomes. In-service training of the general duty nurses, public health nurses and CHEWs to upgrade their midwifery skills would be a viable short-term option for Enugu state to improve perinatal services. The curriculum for such in-service training should be developed and supervised by the Nursing and Midwifery Council of Nigeria to ensure that the signal tasks recommended by the ICM are covered to acceptable standards of proficiency. Such a strategy has been adopted by many nations with shortage of SBA and has been shown to improve their perinatal outcomes.^[16] A more sustainable option would be to incorporate competency-based midwifery training into the pre-service training curricula of general and public health nurses, CHEW and JCHEW.

Although many pre-service schools are located in Enugu state, most of the schools are federal government schools which train health workers for the entire nation of Nigeria not Enugu state alone. As shown in Table 2, the pre-service school graduates prefer to work at the better remunerating tertiary and secondary health care facilities which in addition are also located in the urban and semi-urban areas of the state.

Only very competitive package of incentives and motivation could attract skilled health workers to the rural areas if opportunities for employment also exist in the urban areas.^[30] Examples of factors that have proved effective in health worker motivation and retention in some developing countries include financial incentives, guarantee for career development, opportunity for continuing education, availability of resources to provide services, recognition and appreciation by supervising officers and patients/host communities and acceptable level of modern infrastructure at facilities and host communities.^[30] Some of these factors serve as incentives to accept the job while others serve as the enabling environments and motivation to provide services. Both groups of factors are concurrently needed to enhance retention of skilled health workers especially at the more rural health facilities.^[31] Poor remuneration, rural location, infrastructural challenges and other demotivating factors could have contributed to the dearth of SBAs in Enugu state PHC system.

We conclude that the PHC system in Enugu state has acute shortage of SBAs making it unlikely for the state to meet the MDG 4 and 5 targets unless urgent actions are taken to improve the SBA staffing level in the state. It would also be impossible to provide effective free MNCH services in the state unless the identified SBA shortage is first redressed.

We recommend in-service training of the JCHEW, CHEWs and nurses to upgrade the midwifery skills of the existing staff while a system of incentives should be established to attract qualified SBAs into the PHC system. Incorporation of competency-based midwifery training into the pre-service training curricula of nurses, CHEW and JCHEW would provide more sustainable supply of SBAs in Enugu state PHC system. A constitutional amendment

providing for complementary funding of the nation's PHC system by the federal and state governments would be necessary to provide the necessary resources for MNCH services as local government councils alone are unlikely to possess the resources to provide functional MNCH services at the PHC facilities.

References

1. World Health Organization. World Health Statistics 2012. World Health Organization; Geneva Switzerland. 2012.
2. United Nations General Assembly. Road Map Towards the Implementation of the United Nations Millennium Declaration. Report of the Secretary-General. UN; 2001. p. 6.
3. World Health Organization. Making Pregnancy safer: The Critical Role of the Skilled Attendant: A Joint Statement by WHO, ICM and FIGO. Geneva, Switzerland: WHO; 2004.
4. International Confederation of Midwives. Essential Competencies for Basic Midwifery Practice 2010; 2013. ICM; 2010. Available at <http://www.internationalmidwives.org/assets/uploads/documents/CoreDocuments/ICM%20Essential%20Competencies%20for%20Basic%20Midwifery%20Practice%202010,%20revised%202013.pdf>. [Last accessed on 2014 Oct 11].
5. Lawn JE, Osrin D, Adler A, Cousens S. Four million neonatal deaths: Counting and attribution of cause of death. *Paediatr Perinat Epidemiol* 2008;22:410-6.
6. Lawn JE, Cousens S, Zupan J. Lancet Neonatal Survival Steering Team 4 million neonatal deaths: When? Where? Why? *Lancet* 2005;365:891-900.
7. Lawn JE, Yakob MY, Haws RA, Soomro T, Darmstadt GL, Bhutta ZA. 3.2 million stillbirths: Epidemiology and overview of the evidence review. *BMC Pregnancy Childbirth* 2009;9 Suppl 1:S2.
8. Bhutta ZA, Chopra M, Axelson H, Berman P, Boerma T, Bryce J, *et al*. Countdown to 2015 decade report (2000-10): Taking stock of maternal, newborn, and child survival. *Lancet* 2010;375:2032-44.
9. Victora CG, Wagstaff A, Schellenberg JA, Gwatkin D, Claeson M, Habicht JP. Applying an equity lens to child health and mortality: More of the same is not enough. *Lancet* 2003;362:233-41.
10. Chandler CI, Chonya S, Mtei F, Reyburn H, Whitty CJ. Motivation, money and respect: A mixed-method study of Tanzanian non-physician clinicians. *Soc Sci Med* 2009;68:2078-88.
11. Mullan F, Frehywot S. Non-physician clinicians in 47 sub-Saharan African countries. *Lancet* 2007;370:2158-63.
12. Dovlo D. Using mid-level cadres as substitutes for internationally mobile health professionals in Africa. A desk review. *Hum Resour Health* 2004;2:7.
13. Nabudere H, Asiimwe D, Mijumbi R. Task shifting in maternal and child health care: An evidence brief for Uganda. *Int J Technol Assess Health Care* 2011;27:173-9.
14. Mansoor GF, Hill PS, Barss P. Midwifery training in post-conflict Afghanistan: Tensions between educational standards and rural community needs. *Health Policy Plan* 2012;27:60-8.
15. Bajpai N, Dholakia R, Towle M. Increasing The Availability Of Skilled Birth Attendance In Rural India. CGC | SA Working Paper No. 9. Working papers series Columbia Global Centers | South Asia: Columbia University; 2013.
16. Fulton BD, Scheffler RM, Sparkes SP, Auh EY, Vujicic M, Soucat A. Health workforce skill mix and task shifting in low income countries: A review of recent evidence. *Hum Resour Health* 2011;9:1.
17. Mansoor GF, Hashemy P, Gohar F, Wood ME, Ayoubi SF, Todd CS. Midwifery retention and coverage and impact on service utilisation in Afghanistan. *Midwifery* 2013;29:1088-94.
18. Federal Ministry of Health. Saving Newborn Lives in Nigeria: Newborn Health in the Context of the Integrated Maternal, Newborn and Child Health Strategy. 2nd ed. Abuja Nigeria: Federal Ministry of Health, Save the Children, Jhpiego; 2011.
19. Lawn JE, Kerber K, Enweronu-Laryea C, Massee Bateman O. Newborn survival in low resource settings - Are we delivering? *BJOG* 2009;116 Suppl 1:49-59.
20. Lawn JE, Kinney MV, Black RE, Pitt C, Cousens S, Kerber K, *et al*. Newborn survival: A multi-country analysis of a decade of change. *Health Policy Plan* 2012;27 Suppl 3:iii6-28.
21. National Population Commission and ICF Macro. Nigeria Demographic and Health Survey 2008. Abuja Nigeria: National Population Commission and ICF Macro; 2009.
22. Abdurraheem I, Olapipo A, Amodu M. Primary health care services in Nigeria: Critical issues and strategies for enhancing the use by the rural communities. *J Public Health Epidemiol* 2012;4:5-13.
23. Enugu State Ministry of Health. Policy Brief on Free Maternal and Childcare Services. Enugu: Ministry of Health Enugu; 2009.
24. Adegoke AA, Mani S, Abubakar A, van den Broek N. Capacity building of skilled birth attendants: A review of pre-service education curricula. *Midwifery* 2013;29:e64-72.
25. World Health Organization. Density of doctors, nurses and midwives in the 49 priority countries. WHO; Geneva, Switzerland. 2010. Available from: http://www.who.int/hrh/workforce_mdgs/en/. [Last accessed on 2014 Aug 15].
26. Henry LR, Hooker RS. Retention of physician assistants in rural health clinics. *J Rural Health* 2007;23:207-14.
27. Zainullah P, Ansari N, Yari K, Azimi M, Turkmani S, Azfar P, *et al*. Establishing midwifery in low-resource settings: Guidance from a mixed-methods evaluation of the Afghanistan midwifery education program. *Midwifery* 2014;30:1056-62.
28. Carlo WA, Goudar SS, Jehan I, Chomba E, Tshetu A, Garces A, *et al*. Newborn-care training and perinatal mortality in developing countries. *N Engl J Med* 2010;362:614-23.
29. Bhutta ZA, Lassi ZS, Mansoor N. Systematic Review on Human Resources for Health Interventions to Improve Maternal Health Outcomes: Evidence from Developing Countries. WHO; Geneva Switzerland. 2010.
30. Willis-Shattuck M, Bidwell P, Thomas S, Wyness L, Blaauw D, Ditlopo P. Motivation and retention of health workers in developing countries: A systematic review. *BMC Health Serv Res* 2008;8:247.
31. Chen LC. Striking the right balance: Health workforce retention in remote and rural areas. *Bull World Health Organ* 2010;88:323, A.

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