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SKILLED BIRTH ATTENDANTS IN HAITI: AN ASSESSMENT PROJECT

Skilled Birth Attendants in Haiti: An Assessment Project

Thesis
Submitted to the Faculty
Yale University School of Nursing

In Partial Fulfillment
of the Requirements for the Degree
Master of Science in Nursing

Nicole Zickler

May 2, 2014

This thesis is accepted in partial fulfillment of the requirements for the degree Master of Science in Nursing.

Marjorie Funk

May 2, 2014

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Nicole Zickler

May 2, 2014

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With gratitude,

Nicole

Abstract

Objective: To evaluate a cohort of graduates from a grassroots skilled birth attendant training program in Haiti to determine if they meet global standards of competency established by the International Confederation of Midwives.

Design and setting: A testing instrument that included both a 50-question, multiple choice knowledge test and two emergency skills tests (postpartum hemorrhage and neonatal resuscitation) was adopted from the USAID Quality Assurance Project. A convenience sample of 30 skilled birth attendants completed the knowledge test and, of this cohort, a random sample of 18 completed the skills test. Data collection took place in Hinche, Haiti in July, 2013.

Findings: On average, participants were correct for 59% of the knowledge questions, 34% of the skills steps for postpartum hemorrhage, and 39% of the skills steps for neonatal resuscitation.

Conclusions: Emphasizing emergency simulation training and opportunities to refresh emergency skills periodically is recommended to ensure competency in a cohort of skilled birth attendants. This research is discussed in the context of the Haitian health care system fraught by extreme poverty, lack of basic infrastructure, and a critical shortage of healthcare workers.

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Background

Haiti is the poorest nation in the western hemisphere (United Nations Development Program, 2013). Over 60% of Haiti's 10.17 million people live in extreme poverty on less than \$1.25 per day (Ministry of Public Health and Population, Haitian Childhood Institute, & ICF International, 2013). Consequently, the United Nations Development Program ranked Haiti 161st of 187 countries in 2013 on the Human Development Index that combines life expectancy, education, and income into one statistic to reflect development status (United Nations Development Program, 2013). In contrast, Haiti's neighbor, the Dominican Republic is ranked 96th (United Nations Development Program, 2013). Recurrent natural disasters, diplomatic and food security crises, political unrest, and environmental degradation have resulted in a population that has suffered from some of the world's worst health indicators (Chatterjee, 2008; Dupuy, 2010; USAID, 2014; Vertefeuille, Dowell, Domercant, & Tappero, 2013). Haiti made considerable progress in reducing the under five-child mortality rate and the maternal mortality ratio (MMR) each by 40% between the years 1990 and 2012 (Amibor, 2012). However, maternal mortality remains unacceptably high at 350 deaths per 100,000 live births, down from 410 deaths per 100,000 in 2005, compared to a regional average of 81 per 100,000 births (Table 1) (United Nations, 2013). The major causes of maternal death in Haiti are hemorrhage, eclampsia, abortion, and sepsis (Pan American Health Organization/World Health Organization, 2013). Despite a steady decline in the MMR over the past 2 decades, Haiti will not likely realize the target set out by the United Nations Millennium Development Goals to reduce maternal mortality to 150 per 100,000 by 2015 (Amibor, 2012; United Nations, 2001).

Many developing countries have prioritized maternal health as a result of the Millennium Development Goals (Hogan et al., 2010; World Health Organization, 2004). An increase in the percentage of deliveries with skilled attendants has been identified as a critical strategy to reduce maternal mortality and morbidity (Graham, Themmen, Bassane, Meda, & De Brouwere, 2008; World Health Organization, 2004). The World Health Organization (WHO) defines a skilled birth attendant (SBA) as “an accredited health professional such as midwife, doctor or nurse who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns (World Health Organization, 2004).” An estimated 74% of maternal deaths could be averted if all women had access to education, assessment and treatment during pregnancy or in the event of birth complications (Hunt & Bueno de Mesquita, n.d.).

According to the Haiti Mortality, Morbidity, and Service Utilization Survey, skilled health personnel attended 37% of births in Haiti in 2012. It increased from 26% in 2005, but is well below the average of 90% attendance in the region of Latin America and the Caribbean (Ministry of Public Health and Population, Haitian Childhood Institute, & ICF International, 2013). However, there are notable regional and socioeconomic disparities in Haiti. Skilled birth attendance is as low as 24% in rural areas versus 60% in cities (Table 1) (Ministry of Public Health and Population, Haitian Childhood Institute, & ICF International, 2013). The poorest quintile of women is only attended at a rate of 10% while women with no formal education are attended 14% of the time (Ministry of Public Health and Population, Haitian Childhood Institute, & ICF

International, 2013). Gains have been realized in antenatal care coverage with 90% of women, having at least one prenatal visit with a skilled provider during the course of their pregnancy and 67% of women receiving the recommended four antenatal visits, which is an increase from 85% and 54% in 2006 respectively (Table 1) (Ministry of Public Health and Population, Haitian Childhood Institute, & ICF International, 2013). Despite high levels of knowledge of family planning, just 31% are using a modern method of birth control compared to 72.8% in the region. Notably, more than 53% of currently married women want no more children (Table 1) (Ministry of Public Health and Population, Haitian Childhood Institute, & ICF International, 2013).

Haiti has a critical need for skilled healthcare workers. This, together with a lack of basic infrastructure with sparse transportation networks and limited access to contraception and safe abortion constitute primary obstacles to improving health outcomes (JSI Research & Training Institute, Inc, 2009). Of the 38 countries estimated to have severe shortages of midwives by the WHO, Haiti is among the bottom three (Campbell, Fauveau, ten Hoop-Bender, Matthews, & McManus, 2011; UNFPA, 2011). There is a very poor ratio of health workers, with only one doctor for 8,000 inhabitants, one nurse for 6,000 inhabitants, and one midwife for every 50,000 inhabitants (United Nations Population Fund, 2013). It has been suggested that, on average, countries with fewer than 2.5 health care professionals (doctors, nurses and midwives) per 1,000 population will fail to achieve an 80% coverage rate for deliveries by SBAs (World Health Organization, 2006). Haiti falls far below this threshold with 0.35 doctors, nurses and midwives per 1,000 (World Health Organization, 2012). Faced with impoverished working conditions and general domestic instability, it is not surprising that Haitian

workers emigrate to countries, such as the USA, that offer prosperity and a better life. It is estimated that when Haitians move to the USA, they boost their productivity seven fold and their income 680% (Jadotte, 2012). For this reason, the main export of Haiti is skilled labor, with an estimated 78% of college graduates leaving the country (Jadotte, 2012).

Haiti's fragile healthcare system was profoundly affected by the catastrophic earthquake that struck on January 12, 2010, claiming more than 200,000 lives, displacing more than one million, and altogether affecting the lives of over 3,000,000 or 30% of the population (Amibor, 2012; Unicef, 2010). The loss of life and infrastructure resulting from the earthquake and the resulting cholera epidemic proved significantly challenging to an already weakened healthcare system. Within the disaster zone, 30 out of 45 hospitals were destroyed or damaged, as were many health centers (Garfield & Berryman, 2012). The only midwifery school in the country was among the casualties, further compromising progress towards improved health service infrastructure and increased skilled birth attendance.

Haiti's healthcare system is comprised of a combination of public and private sector services. Despite the work of over 600 non-governmental organizations providing services throughout the country, reproductive health services are lacking with a disproportionate burden placed on rural areas (Garfield & Berryman, 2012; Ministry of Public Health and Population, Haitian Childhood Institute, & ICF International, 2013). The national availability of emergency obstetric services is only 12% of the recommended minimum (World Health Organization, 2012). Recognizing the critical reproductive health needs in Haiti, the Ministry of Health has supported a national strategy for safer motherhood corresponding to international funding availability. Soins

Obstetrique Gratuits financed by the Canadian Development Agency, the WHO, and others and led by Haiti's Ministry of Public Health and Population, provides free access to obstetric health care for pregnant woman and newborns and has contributed to the increase in institutional deliveries (Amibor, 2012; World Health Organization, 2010; World Health Organization, 2012).

Despite a political commitment to improving reproductive healthcare, difficult and delayed access continues to undermine care for women. Although services are “free” for pregnant woman, there are opportunity costs associated with access to care, such as travel expenses and eating and sleeping away from home for the duration of care (Gage & Calixte, 2006). Low expectations of care accessed at a healthcare facility and a general sense of distrust of medical providers further undermines Haitian women's motivation to invest in expenses associated with institutional care. With over 70% of women delivering at home in their communities, many feel more comfortable and trusting of traditional birth attendants than they do of SBAs in a hospital (JSI Research & Training Institute, Inc, 2009).

Competency of SBAs has increasingly gained importance as a key ingredient to improving maternal and newborn outcomes. Studies have shown that substandard practices, as well as delays in recognition and treatment of life-threatening complications directly contribute to maternal deaths (Ronsmans, Graham, & Lancet Maternal Survival Series steering group, 2006). The State of the World's Midwifery Report highlights the need to have a sufficient workforce of well-trained, accessible midwives to improve maternal health in developing countries (UNFPA, 2011). This demands a shift from the focus of measuring the number of attended births as an indicator of effective care toward

active management of key aspects of service delivery and program performance at all levels (Hodgins, 2013). Unfortunately, this poses a challenge to public and private efforts aimed at improving reproductive health in Haiti as basic service infrastructure and systems are grossly lacking. A functioning health system requires an enabling environment including access to medication, equipment and supplies and an established referral network (World Health Organization, 2004). Ith, Dawson, and Homer succinctly summarize the challenges: “*Elements of the work environment, such as management, incentives and remuneration, education and training, regulatory frameworks and policies, have a severe negative impact on the recruitment and retention of health professionals, the productivity and performance of health facilities, and ultimately on the outcomes of women* (2012).”

In an effort to address the gross lack of midwifery providers in Haiti, the new National Midwifery School (Ecole Nationale des Infirmieres Sages-Femmes) has recently reopened in November 2013 with an inaugural class of 80 students. The school will offer two study options: a 3-year direct-entry midwifery course for high school graduates or an 18-month midwifery training program for existing nurses. While the school will make a positive contribution to maternal health in Haiti, it will still take years to train the estimated 563 more skilled birth attendants needed to reach the target set out by the Millennium Development Goals, especially considering the inevitable brain drain that occurs with skilled labor in Haiti. In many countries, delegation to lower cadres of workers, such as community health workers, has become a crucial strategy to meet the urgent need for trained providers.

In the meantime, international nongovernmental organizations are working to fill in the gaps. An organization called Midwives For Haiti (MFH), located in the rural, underserved Central Plateau region of Haiti is training Haitian nurses to be SBAs, also known as auxiliary midwives, in a 12-month program. Founded by an American nurse midwife working in collaboration with Haiti's Ministry of Health, MFH has trained 71 SBAs since 2006 (Midwives For Haiti, 2014). Given the shortage of maternal health providers in Haiti, MFH has made a meaningful contribution by training nearly one-third of the total SBAs presently working in Haiti. Relying on private funding and teaching support from volunteer nurses, midwives and doctors from the United States and Canada, MFH staffs a local regional hospital with trained birth attendants, provides prenatal care and infectious disease screening in 20 remote villages with a mobile clinic, and offers a 5-month training program to traditional birth attendants, known as Matrons, teaching basic skills and distributing clean birth kits (Brunk, 2012). In 2013, graduates from MFH performed over 60,000 prenatal exams and attended over 12,000 births throughout Haiti (Midwives For Haiti, 2014).

The International Confederation of Midwives (ICM) is responsible for ensuring global standards of midwifery education, practice and regulation and has established essential competencies for basic midwifery practice and education (International Confederation of Midwives, 2013). The ICM states that the minimum length of midwifery education for a post-nursing/health care provider is 18 months. In comparison, the MFH program, traditionally 10 months in duration, has recently been increased to 12 months. While global standards have been established, there is no standardized assessment tool to evaluate SBAs. There is consensus in the literature that evaluation of

SBAAs must involve knowledge and skills assessment. This may include multiple choice examinations, written partograph case study questions, observed check offs in a clinical setting and simulated evaluation tools evaluating specific critical skills (Ariff et al., 2010; Harvey et al., 2004; Partamin et al., 2012; Spangler, 2012). The United States Agency for International Development (USAID) has piloted and tested an assessment tool in several developing countries across a varied cadre of healthcare providers (Harvey et al., 2004; Harvey et al., 2007; Mutungi et al., 2008).

With the emergence of global standards for midwifery competency and education there is an interest and need to evaluate prior graduates of the MFH program to determine if they meet the global standards of competency established by the ICM. This study aims to assess a cohort of graduates from a grassroots SBA training program in rural Haiti, using an established evaluation tool from USAID, to see if they meet global standards to be called skilled birth attendants.

Methods

This is a prospective descriptive study that assessed the knowledge and skills of a convenience sample of graduates of the MFH training program who had gathered for continuing education. All of the auxiliary midwives who attended the training (N=30) completed the knowledge test. A random selection of 18 individuals from this cohort also completed a skills test portion using a structured assessment tool to assess specific skills under simulation.

This study used two data collection instruments: 1) a knowledge test; and 2) a skills test. The midwives completed a knowledge test from the USAID Quality Assurance Project for Maternal Health Evaluation (USAID QAP MHE). This included a 50-question multiple choice test of clinical knowledge related to the management of normal labor and delivery and common obstetric complications plus immediate postpartum care for the mother and newborn (Mutungi et al., 2008). The test was administered in Creole.

To assess skills, participants performed two sets of tasks related to neonatal resuscitation and postpartum hemorrhage. Participants performed these tasks on anatomical models. Their performance was evaluated using an objective structured clinical evaluation adopted from the USAID QAP MHE with the support of a trained translator (Mutungi et al., 2008). Demographic information regarding characteristics of the sample was collected at the time of test taking. While an enabling environment has been identified as playing a critical role in supporting SBAs in their efforts to perform competently, assessing the clinical settings of the cohort was beyond the scope of this study (A. Adegoke & van den Broek, 2009).

Data collection took place on July 5 and 6, 2013 in Hinche, Haiti. Hinche is the capital city of the Centre region of Haiti, approximately 128 km from Port-au-Prince. The participating SBAs were provided verbal and written information in Creole before obtaining signed informed consent. Confidentiality of the information provided was maintained throughout the study. Participants were assured of their freedom to withdraw without any negative consequence. The author performed all of the assessments. The knowledge assessment was completed in one sitting. The skills test was completed the subsequent day with participants remaining in a contained area until testing and leaving the facility immediately afterward in order to preserve test integrity. The Human Research Ethics Committee of Yale University granted approval for this research project. (HSC# 1305012140). Data analysis was done using SAS 9.1. Standard measures of central tendency and dispersion and frequencies were used to describe the sample and results of the knowledge and skills tests.

Findings

A cohort of 30 graduates from the MFH training program was evaluated to assess competency on a knowledge test and 18 participants were randomly selected from the cohort of 30 to complete the two skills tests: postpartum hemorrhage and neonatal resuscitation.

Demographics

The sample had a mean age of 37 years with an average 18 years of education. Fifty percent of the sample had graduated from MFH within the last 2 years. The majority lived in Hinche (80%) and worked as auxiliary midwives in a hospital setting (60%). Working experience in this cohort averaged 2.5 years but ranged from 0 to 5.3 years. Sample characteristics are shown in Tables 2 and 3.

Knowledge Test

On average, participants answered 59% of the knowledge test questions correctly with a range of 46-80%. Table 4 summarizes the test results. The point biserial index was used to assess knowledge test question discrimination. Just over 50% of the questions were shown to be fair or good discriminators of knowledge (See Table 5 for details).

Skills Tests

Skills assessment started with postpartum hemorrhage. There are 21 steps associated with this skill. On average, participants executed 34% of these steps correctly. This included initiating oxytocin infusion or administering ergometrine (67%), introducing one hand into the vagina and making a fist (62%) and monitoring vital signs (61%). The critical skill of bimanual compression was done incorrectly by 61% and 78% failed to make sure that the uterus remained firmly contracted. While 67% performed

hand washing at the beginning of the procedure, 72% did not wash hands after glove removal at the end of the procedure. Communicating with the patient was almost universally absent: 94% did not encourage questions or listen to the woman's concerns, and 83% did not explain to the woman what was being done. Figure 1 summarizes the results of the postpartum hemorrhage simulation assessment.

There are 20 steps to complete for the second skills test, neonatal resuscitation. Nearly all the participants failed to place the newborn in the correct position for opening an airway (94%). While 67% correctly placed the mask over the baby's face, only 29% repositioned the head and provided suction when the initial attempt was unsuccessful. Thirty-nine percent evaluated respirations, heart rate and coloring after 30 seconds. About half the participants listed skin coloring as a criteria for evaluating the status of their patient. However, only 24% recognized the importance of having a heart rate above 100 beats per minute. In the event that the baby is still not breathing, 63% failed to continue on with ventilations at 40-60 per minute. See Figure 2 for highlights of the neonatal resuscitation simulation assessment.

Discussion

For the purpose of this research, competence is defined as possessing sufficient knowledge and skills to comply with predefined clinical standards (Fullerton, Thompson, & Johnson, 2013). USAID used 60% as a minimum score to reflect competency on the assessment tool, acknowledging that this, in itself, is somewhat arbitrary (Harvey et al., 2004). In general, the competency of this cohort at performing neonatal resuscitation and postpartum hemorrhage skills scored low, with an average of 40% and 34% of the skills performed correctly, respectively. Participants performed better on the knowledge test with an average of 59% of questions answered correctly. This outcome is not unlike results that Harvey et al. found when they used a similar testing instrument to assess SBAs in six low resource countries; SBAs averaged 60% on the knowledge test with 48% and 30% successfully completing the skills needed for neonatal resuscitation, and for postpartum hemorrhage (Harvey et al., 2004; Harvey et al., 2007; Mutungi et al., 2008).

Several factors could be contributing to poor performance. First, until recently, MFH has not included simulation training in their curriculum. For this reason, the participants were relatively uninitiated with the experience of performing under simulation. Furthermore, regular in-service training that primes the emergency skills of providers is not presently available to this group. Refresher training has been shown to be positively correlated with clinical skill retention and performance (Carlough & McCall, 2005; Gobezyayehu et al., 2014). In personal communication with Nadene Brunk, the Executive Director of MFH, a general lack of leadership in the workplace, an absence of standardized clinical protocols and an impoverished working environment in various

healthcare settings present further obstacles for trained SBAs to maintain their skills and standards of care (Brunk, 2013).

Although knowledge and skills are essential components of competency, research has shown that a practitioner's ability to translate knowledge into practice is primary. (Andreatta, Gans-Larty, Debpuur, Ofosu, & Perosky, 2011; Fullerton, Thompson, & Johnson, 2013). The outcomes of this study show that there is a gap between the provider's knowledge and their skills performance. Publication of Global Standards for Midwifery Education by the ICM now sets the benchmark for the training of midwives using global standards and norms ensuring that all cadres of SBAs can achieve competency (A. A. Adegoke, Mani, Abubakar, & van den Broek, 2013; International Confederation of Midwives, 2013). The ICM standards provide guidance to all programs that seek to train SBAs. Training programs for SBAs, like MFH, fill an important niche by training available health care workers who are at less risk of emigration, prepared to practiced in under-served areas of Haiti, and can be trained relatively quickly in 12 months versus the state program that is either 18 or 36 months depending on the student's prior education.

This study has several limitations. The small sample negates an ability to generalize the findings to a larger population. Convenience sampling introduces the possibility of bias with the results of the assessment. Given the limited experience of the participants with simulation training, the results may have been confounded by anxiety; performance in simulation in this cohort may not be an accurate reflection of actual ability. Systematic observation of actual clinical practice was beyond the scope of this

study but would have been useful to better assess clinical skills in the context of a challenged working environment.

Determining competency based on test scores of a USAID evaluation tool is currently based on the convention that 60% reflects competency. However, this is an assumption that is not verified by systematic analysis. The point biserial index of the multiple choice knowledge assessment used to assess test question discrimination showed that 46% of the test questions were poor discriminators of knowledge. Given that the USAID tool had been widely used with other cohorts, it proved valuable for this study by providing some statistical comparison. However, for future use the multiple choice knowledge test may need to be optimized.

Providing accurate statistics regarding indicators for the Millennium Development Goals proved difficult. Among large data sets published by the WHO, the World Bank, the United Nations Population Fund, and the Haitian Ministry of Public Health and Population there remains significant discrepancies in reported outcomes (Ministry of Public Health and Population, Haitian Childhood Institute, & ICF International, 2013; UNFPA, 2011; World Health Organization, 2012; World Health Organization, 2012). Furthermore, there is concern about consistent underreporting of the MMR due to misclassification of maternal deaths and poor data collection in under-resourced countries (Hogan et al., 2010). Ultimately, the lack of reliability regarding the MMR and other measures of the Millennium Development Goals undermines the data's ability to be a robust indicator of progress.

With very little published on this topic, this study succeeds at shedding light on maternal health in Haiti. Progress has been made towards lowering the maternal mortality

ratio and increasing skilled birth attendance in this low resource country; however, much more needs to be done. This study documents how a grassroots nonprofit organization with limited resources can use a publically available assessment tool to evaluate competency of their trainees.

Conclusion

The study evaluated a cohort of graduates from a foreign-supported, regional educational program in Hinche, Haiti that trains Haitian nurses to be skilled birth attendants to see if they meet global competency standards. While the assessment scores were low, they were comparable to a similar cadre of providers that were tested with the same instrument in six other low-resource countries. Emergency simulation training and opportunities to refresh emergency skills is recommended to ensure and maintain competency. Outcomes of this research cannot be discussed without also considering the context of a healthcare system in Haiti fraught by extreme poverty, lack of basic infrastructure, and a critical shortage of healthcare workers.

Appendix

Table 1
Human development statistics

	Haiti	Dominican Republic	USA	Region
Population (million)	10.17	10.3	318	609.8
Human Development Index	161	96	3	-
% Poverty (<\$1.25/day)	61.7	2.2	-	5.5
Total Fertility Rate	3.21	2.52	1.99	2.3
Maternal Mortality Ratio	350	150	21	81
% Using Contraception	31	72.9	78.6	72.8
Neonatal Mortality Ratio	31	28	6	16
% Births with SBA	37	95	99.4	90
% Using Antenatal Care (1x)	60	96	-	96
% Using Antenatal Care (4x)	67	94.5	-	88

SBA, skilled birth attendant

Table 2
Demographic characteristics of graduates (N=30)

Characteristics	N	%
Year Qualified as SBAs		
2007	2	7.69
2008	2	7.69
2009	3	11.54
2010	6	23.08
2011	9	34.62
2012	4	15.38
Health Facility		
District Hospital	15	60.00
Health Center	7	28.00
Sub-district Hospital	3	12.00
Province		
Hinche	24	80.00
Cerca da-Source	2	6.67
Torseck	2	6.67
Cange	1	3.33
Cayes	1	3.33
Position		
Auxiliary Midwife	30	100.00

SBA, skilled birth attendant

Table 3
Age, years of education and months of experience (N=30)

	Mean +/- SD	Median	Range
Age	36.67 +/- 4.40	36.00	27.00-45.00
Years Education	17.61 +/- 2.81	17.00	13.00-24.00
Months Practice	30.00 +/-18.68	30.50	0.00-64.00

Table 4
Test scores

Test	Mean (N)+/- SD		Median (N)		Range (N)	
	N	%	N	%	N	%
Knowledge Test – 50 Multiple-Choice Questions (N=30)	29.37 +/- 4.13	58.74 +/- 0.83	29.00	58.00	23.00-40.00	46.00-80
Skills Test – Postpartum Hemorrhage (N=18)	7.05	33.60	7	33.33	2.00-14.00	9.52-66.67
Skills Test – Neonatal Resuscitation (N=18)	8.28	39.42	8	40.00	2.00-15.00	9.52-75.00

Table 5
Knowledge test question discrimination (point biserial index)

	Poor (<0.1)	Fair (0.1-0.3)	Good (0.3)
Multiple Choice Question	23	12	15

Figure 1
Postpartum hemorrhage performance by selected function

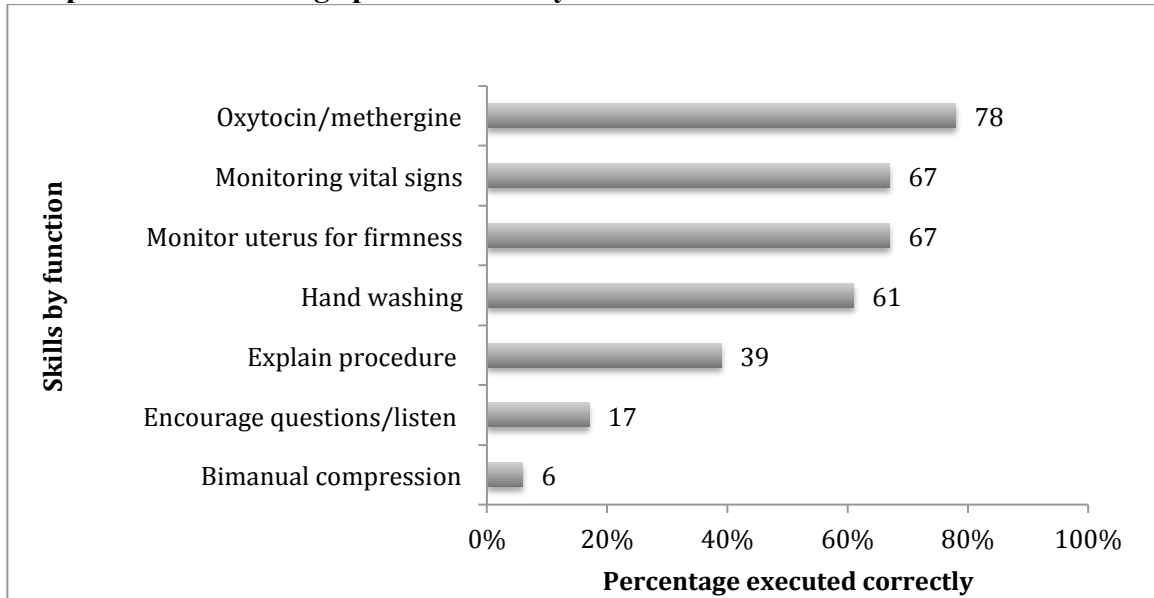
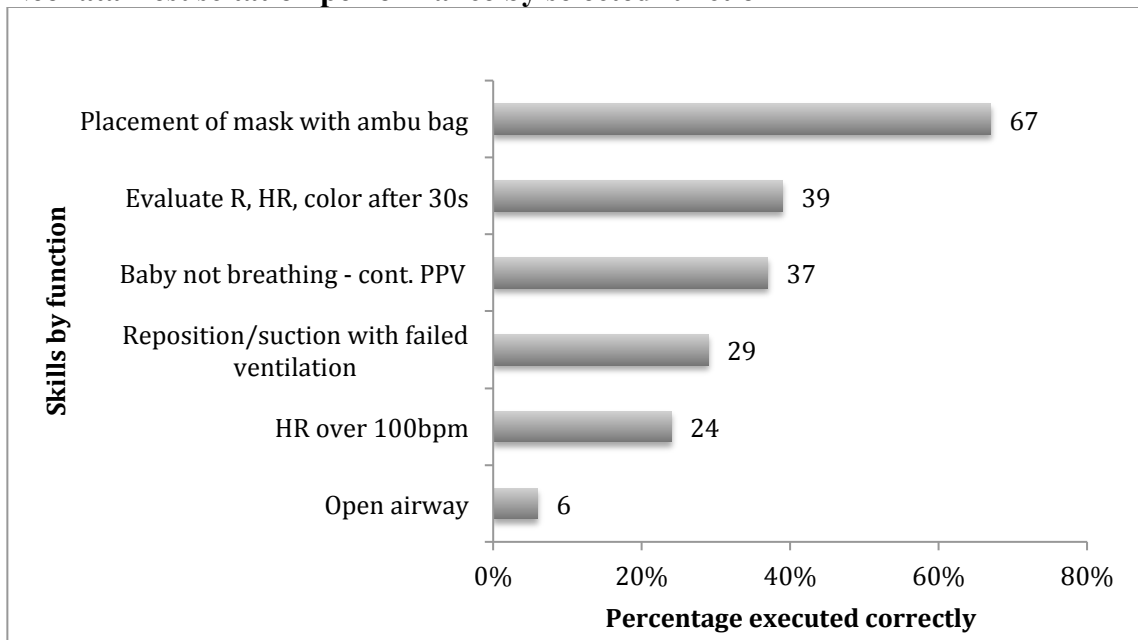


Figure 2
Neonatal resuscitation performance by selected function



References

- Adegoke, A., & van den Broek, N. (2009). Skilled birth attendance-lessons learnt. *BJOG: An International Journal of Obstetrics & Gynaecology*, *116*, 33-40. doi:10.1111/j.1471-0528.2009.02336.x
- Adegoke, A. A., Mani, S., Abubakar, A., & van den Broek, N. (2013). Capacity building of skilled birth attendants: A review of pre-service education curricula. *Midwifery*, *29*, e64-e72. doi:<http://dx.doi.org/10.1016/j.midw.2012.08.009>
- Amibor, P. (2012). What will it take to maintain the maternal and child health gains made in Haiti prior to the 2010 earthquake? : An analysis of past progress, trends, and the prospects for the realization of the United Nations millennium development goals 4 and 5. *Maternal and Child Health Journal*, doi:10.1007/s10995-012-1170-0
- Andreatta, P., Gans-Larty, F., Debpuur, D., Ofosu, A., & Perosky, J. (2011). Evaluation of simulation-based training on the ability of birth attendants to correctly perform bimanual compression as obstetric first aid. *International Journal of Nursing Studies*, *48*, 1275-1280. Retrieved from SCOPUS database.
- Ariff, S., Soofi, S. B., Sadiq, K., Feroze, A. B., Khan, S., Jafarey, S. N., Ali, N., & Bhutta, Z. A. (2010). Evaluation of health workforce competence in maternal and neonatal issues in public health sector of Pakistan: An assessment of their training needs. *BMC Health Services Research*, *10*, 319-327. doi:10.1186/1472-6963-10-319
- Brunk, N. (2012). *Midwives for Haiti program description*. Unpublished manuscript.
- Campbell, J., Fauveau, V., ten Hoop-Bender, P., Matthews, Z. & McManus, J. (2011). *The state of the world's midwifery 2011: Delivering health, saving lives*. Retrieved February 12 http://www.unfpa.org/sowmy/resources/docs/main_report/en_SOWMR_Full.pdf
- Carlough, M., & McCall, M. (2005). Skilled birth attendance: What does it mean and how can it be measured? A clinical skills assessment of maternal and child health workers in Nepal. *International Journal of Gynecology & Obstetrics*, *89*, 200-208. doi:10.1016/j.ijgo.2004.12.044
- Chatterjee, P. (2008). Haiti's forgotten emergency. *The Lancet*, *372*, 615-618. doi:[http://dx.doi.org/10.1016/S0140-6736\(08\)61259-3](http://dx.doi.org/10.1016/S0140-6736(08)61259-3)
- Dupuy, A. (2010). Commentary beyond the earthquake: A wake-up call for Haiti. *Latin American Perspectives*, *37*, 195-204. doi:10.1177/0094582X10366539

- Fullerton, J. T., Thompson, J. B., & Johnson, P. (2013). Competency-based education: The essential basis of pre-service education for the professional midwifery workforce. *Midwifery*, *29*, 1129-1136. Retrieved from SCOPUS database.
- Gage, A. J., & Calixte, M. G. (2006). Effects of the physical accessibility of maternal health services on their use in rural Haiti. *Population Studies*, *60*, 271-288. 44 ref. Retrieved from http://sfx.library.yale.edu/sfx_local?sid=OVID:caghdb&id=pmid:&id=doi:10.1080%2F00324720600895934&issn=0032-4728&isbn=&volume=60&issue=3&spage=271&pages=271-288&date=2006&title=Population+Studies&atitle=Effects+of+the+physical+accessibility+of+maternal+health+services+on+their+use+in+rural+Haiti.&aulast=Gage&pid=%3Cauthor%3EGage%2C+A.+J.%2CCalixte%2C+M.+G.%3C%2Fauthor%3E%3CAN%3E20063199614%3C%2FAN%3E%3Cdn%3E%3C%2Fdn%3E
- Garfield, R. M., & Berryman, E. (2012). Nursing and nursing education in Haiti. *Nursing Outlook*, *60*, 16-20. doi:<http://dx.doi.org/10.1016/j.outlook.2011.03.016>
- Gobezayehu, A. G., Mohammed, H., Dynes, M. M., Desta, B. F., Barry, D., Aklilu, Y., Tessema, H., Tadesse, L., Mikulich, M., Buffington, S. T., & Sibley, L. M. (2014). Knowledge and skills retention among frontline health workers: Community maternal and newborn health training in rural Ethiopia. *Journal of Midwifery & Women's Health*, *59*, S21-S31. doi:10.1111/jmwh.12146
- Graham, W., Themmen, E., Bassane, B., Meda, N., & De Brouwere, V. (2008). Evaluating skilled care at delivery in Burkina Faso: Principles and practice. *Tropical Medicine & International Health : TM & IH*, *13 Suppl 1*, 6-13. doi:10.1111/j.1365-3156.2008.02082.x; 10.1111/j.1365-3156.2008.02082.x
- Harvey, S. A., Ayabaca, P., Bucagu, M., Djibrina, S., Edson, W. N., Gbangbade, S., McCaw-Binns, A., & Burkhalter, B. R. (2004). Skilled birth attendant competence: An initial assessment in four countries, and implications for the safe motherhood movement. *International Journal of Gynecology and Obstetrics*, *87*, 203-210. Retrieved from SCOPUS database.
- Harvey, S. A., Blandon, Y. C., McCaw-Binns, A., Sandino, I., Urbina, L., Rodriguez, C., Gomez, I., Ayabaca, P., Djibrina, S., & Nicaraguan Maternal and Neonatal Health Quality Improvement Group. (2007). Are skilled birth attendants really skilled? A measurement method, some disturbing results and a potential way forward. *Bulletin of the World Health Organization*, *85*, 783-790.
- Hodgins, S. (2013). Achieving better maternal and newborn outcomes: Coherent strategy and pragmatic, tailored implementation. *Global Health: Science and Practice*,
- Hogan, M. C., Foreman, K. J., Naghavi, M., Ahn, S. Y., Wang, M., Makela, S. M., Lopez, A. D., Lozano, R., & Murray, C. J. (2010). Maternal mortality for 181

countries, 1980-2008: A systematic analysis of progress towards millennium development goal 5. *The Lancet*, 375, 1609-1623. Retrieved from SCOPUS database.

Hunt, P., & Bueno de Mesquita. (n.d.). *Reducing maternal mortality. the contribution of the right to the highest attainable standard of health*. Retrieved March 28, 2014, from http://www.unfpa.org/webdav/site/global/shared/documents/publications/reducing_mm.pdf

International Confederation of Midwives. (2013). *Global standards for midwifery education*. Retrieved March 20, 2014, from http://www.internationalmidwives.org/assets/uploads/documents/CoreDocuments/ICM%20Standards%20Guidelines_ammended2013.pdf

Ith, P., Dawson, A., & Homer, C. (2012). Quality of maternity care practices of skilled birth attendants in Cambodia. *International Journal of Evidence-Based Healthcare*, 10, 60-67. doi:<http://dx.doi.org/10.1111/j.1744-1609.2012.00254.x>

Jadotte, E. (2012). *United Nations conference on trade and development. the least developed countries report 2012: Harnessing remittances and diaspora knowledge to build productive capacities background paper. "Brain drain, brain circulation and diaspora networks in Haiti"*. Retrieved March 12, 2014, from <http://unctad.org/en/PublicationsLibrary/ldcr2012-bp1.pdf>

JSI Research & Training Institute, Inc. (2009). *The long wait: Reproductive health care in Haiti*. Retrieved February 4, 2013, from http://rhrc.org/resources/JSI_HaitiReport_2009_compressed.pdf

Midwives For Haiti. (2014). *Our approach*. Retrieved March 22, 2014, from <https://midwivesforhaiti.org/projects.html>

Ministry of Public Health and Population, Haitian Childhood Institute & ICF International. (2013). *2012 Haitian mortality, morbidity and service utilization survey: Key findings*. Retrieved March 1, 2014, from <http://dhsprogram.com/pubs/pdf/SR199/SR199.eng.pdf>

Mutungi, A., Harvey, S., Kibaru, J., Lugina, H., Kinoti, S., Jennings, L., Bornstein, T., & Hizza, E. (2008). *Kenya: Assessment of health workforce competency and facility readiness to provide quality maternal health services*. Bethesda, MD: United States Agency for International Development by the Quality Assurance Project.

Pan American Health Organization/World Health Organization. (2013). *Health in the Americas: Haiti*. Retrieved March 22, 2014, from http://www.paho.org/saludenlasamericas/index.php?id=38&option=com_content&Itemid=&lang=en

- Partamin, Kim, Y., Mungia, J., Faqir, M., Ansari, N., & Evans, C. (2012). Patterns in training, knowledge, and performance of skilled birth attendants providing emergency obstetric and newborn care in Afghanistan. *International Journal of Gynecology & Obstetrics*, *119*, 125-129. doi:10.1016/j.ijgo.2012.05.030
- Ronsmans, C., Graham, W. J., & Lancet Maternal Survival Series steering group. (2006). Maternal mortality: Who, when, where, and why. *Lancet*, *368*, 1189-1200. doi:10.1016/S0140-6736(06)69380-X
- Spangler, S. A. (2012). Assessing skilled birth attendants and emergency obstetric care in rural Tanzania: The inadequacy of using global standards and indicators to measure local realities. *Reproductive Health Matters*, *20*, 133-141. doi:10.1016/S0968-8080(12)39603-4
- UNFPA. (2011). *The state of the world's midwifery: Haiti*. Retrieved January 14, 2013, from http://www.unfpa.org/sowmy/resources/docs/country_info/profile/en_Haiti_SoWMy_Profile.pdf;
- Unicef. (2010). *Unicef humanitarian action and recovery: Haiti 2010–2011. mid-year review of 2010 humanitarian action report*. Retrieved January 4, 2013, from http://reliefweb.int/sites/reliefweb.int/files/resources/A1E78476BAE252D68525773C0064B6D5-Full_Report.pdf
- United Nations. (2001). *General assembly, 56th session. road map towards the implementation of the United Nations millennium declaration: Report of the secretary-general*. Retrieved January 14, 2013, from <http://www.un.org/documents/ga/docs/56/a56326.pdf>
- United Nations. (2013). *Millennium development goals indicators*. Retrieved March 1, 2014, from <http://unstats.un.org/unsd/mdg/Host.aspx?Content=Data/snapshots.htm>
- United Nations Development Program. (2013). *Human development report*. Retrieved March 1, 2014, from <http://hdr.undp.org/en/countries>
- United Nations Population Fund. (2013). *Dispatch: A new midwifery school brings hope to Haitian mothers*. Retrieved February 28, 2014, from <http://www.unfpa.org/public/home/news/pid/15524>
- USAID. (2014). *Global health: Haiti*. Retrieved March 26, 2014, from <http://www.usaid.gov/haiti/global-health>
- Vertefeuille, J. F., Dowell, S. F., Domercant, J. W., & Tappero, J. W. (2013). Cautious optimism on public health in post-earthquake Haiti. *The Lancet*, *381*, 517-519. doi:[http://dx.doi.org/10.1016/S0140-6736\(13\)60051-3](http://dx.doi.org/10.1016/S0140-6736(13)60051-3)

- World Health Organization. (2004). *Making pregnancy safer: The critical role of the skilled birth attendant*. Retrieved April 29, 2013, from http://www.who.int/maternal_child_adolescent/documents/9241591692/en/index.html
- World Health Organization. (2006). *The world health report 2006 - working together for health*. Retrieved March 31, 2014, from <http://www.who.int/whr/2006/en/>
- World Health Organization. (2010). *Free obstetric care in Haiti. making pregnancy safer for mothers and newborns*. Retrieved January 4, 2013, from http://whqlibdoc.who.int/hq/2010/WHO_MPS_10.05_eng.pdf
- World Health Organization. (2012). *Countdown to 2015: Partnership for maternal, newborn & child health*. Retrieved February 4, 2013, from <http://www.countdown2015mnch.org>
- World Health Organization. (2012). *Free obstetric care in Haiti*. Retrieved March 1, 2014, from http://www.who.int/features/2012/haiti_obstetric_care/en/
- World Health Organization. (2012). *The World Bank group data: Dominican Republic*. Retrieved March 1, 2014, from <http://data.worldbank.org/country/DominicanRepublic>