

**Accuracy in Reporting of
Kentucky Certified Nurse-Midwives as Attendants
in Birth Registration Data**

Submitted to the Faculty
Yale University School of Nursing

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Nursing Practice

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This DNP Project is accepted in partial fulfillment of the requirements for the degree
Doctor of Nursing Practice.

A handwritten signature in black ink, reading "Holly Powell Kennedy". The signature is written in a cursive style with a large, looping initial "H".

Holly Powell Kennedy, PhD, CNM, FACNM, FAAN

Date: March 26, 2019

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Date: March 26, 2019

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Table of Contents

<i>Abstract</i>	3
<i>Introduction</i>	4
<i>Methods</i>	6
Aim 1	6
Aim 2:	7
<i>Results</i>	8
Aim 1	8
Figure 1. Sampling Strategy for Kentucky Midwives	9
Table 1. Comparison of CNM 2017 birth logs and Kentucky Vital Statistics Records	10
Aim 2	11
Table 2. Kentucky Birth Registrar Data collection and verification.	11
Table 3. Barriers to Accurate Reporting of Birth Certificate Data	14
Table 4. Individual steps to complete birth certificate worksheet identified by birth registrars	16
<i>Discussion</i>	17
Aim 1	17
Aim 2	18
<i>Strengths and Limitations</i>	21
<i>Conclusion</i>	21
<i>Authors</i>	23
<i>Conflict of Interest</i>	23
<i>Acknowledgements</i>	23
<i>References</i>	24

Abstract

Introduction: Birth certificate data is used nationally to determine healthcare policy, allocation of funds, and to demonstrate the legitimacy and value of Certified Nurse-Midwives (CNMs) in maternal and neonatal outcomes. However, the validity of birth certificate data is questionable, in part because of the data collection process. This data is particularly crucial for midwife-attended births as the correct birth attendant is not always accurately identified. The purpose of this project was to examine the number of CNM reported births as compared to the number recorded by the Kentucky office of vital statistics and to look at the process used by birth registrars to complete the birth certificate.

Methods: CNMs (96%) attending births in hospitals in Kentucky in 2017 kept birth logs. These logs were compared to the 2017 Vital Statistics Birth Certificate data of CNM attended births. Kentucky birth registrars (47%) who work in facilities where CNMs attend births completed a 31 question survey regarding the process of collecting birth certificate data.

Results: In Kentucky, CNM attended births are underrepresented in the state vital statistics by 15.5%. Birth registrars identified barriers to collecting accurate data including lack of training, multiple sources of data, incomplete prenatal records, and absence of systems to help insure accuracy.

Discussion: CNMs need to keep personal and practice birth logs and routinely compare it to hospital data kept by the birth registrar. The state office of vital statistics and hospitals should target training to specific facilities that have the most inaccurate data. The Improving Midwifery Birth Numbers (IMBUE) Initiative through the American College of Nurse-Midwives (ACNM) Division of Research Data Management Section can continue to encourage midwifery students to complete this research in all 50 states.

Accuracy in Reporting of Kentucky Certified Nurse-Midwives as Attendants in Birth Registration Data

Introduction

Certified nurse-midwives (CNMs) practice in all fifty states and attend approximately 7.8% of births nationwide (American College of Nurse-Midwives, [ACNM], 2016). In 2015, CNMs attended 7.5% of births in Kentucky (Kentucky Vital Statistics, [KVS], 2017); however, there is evidence that questions the accuracy of these data (Bushman, 2016 & Biscone, Cranmer, Lewitt, & Martyn, 2017). How the attendant's name is recorded and attributed to the birth can be a complicated and sometimes inefficient process that can result in inaccuracies (Walker, Schmnuk, & Summers, 2004). Months may elapse from the moment a midwife attends the birth to the time it is recorded in the national vital statistics record. One of the many errors that can occur is when a physician is recorded as the birth attendant, when it was actually attended by a CNM. Biscone's et al. (2017) investigation of CNM-attended births in Texas hospitals found that CNMs were underreported by 65%. Underrepresentation of CNMs in vital statistics has financial, political, and even ethical implications (Paine, Greener, & Strobino, 1988).

Birth certificate data are used nationally to reflect population-based evidence on maternal and neonatal outcomes; CNMs depend on these data to demonstrate their role in these outcomes. CNMs are reimbursed for their services by Medicaid and private insurances (ACNM, 2016). Despite a 2011 health policy change that mandates equitable reimbursement, Kentucky still reimburses CNMs at a rate of 75% compared to physician reimbursement for the same services (ACNM, 2011). "Barriers to adequate data collection related to CNM services, specifically those funded by Medicaid, preclude legitimate conclusions about subsequent health care policy." (Sonenberg, 2010, p. 253).

One of the challenges in using birth certificate data is that its validity can be questionable, in part because of the data collection process (Walker et al., 2004). Accuracy is likely to be influenced by the qualifications and expertise of the person collecting the data for the birth certificate, commonly called the birth registrar in hospital settings (Brumberg, Dozor, & Golombek, 2012; Melnik, Guldal, Schoen, Alicandro, & Henfield, 2015). The birth registrar often has no medical or specific training for birth certificate data collection (Northam, Polancich, & Restrepo, 2003; Melnik et al., 2015). The American College of Obstetricians and Gynecologists (ACOG, 2015) found that while clinicians are ultimately responsible for the accuracy of the data, very few are trained how to document and report. Rothwell (2004) emphasized that outdated registration collection methods are concerning, and the timeliness and quality of data are called into question. DiGiuseppe, Aron, Ranbom, Harper, and Rosenthal found the “reliability of birth certificates for many factors that reflect underlying maternal risk and complications of pregnancy remain suspect” (2002, p. 177). These findings are troubling for the midwifery profession as well as for planning and allocation of resources. If midwives are invisible in the reporting of birth data, they will be unable to demonstrate their legitimacy, presence and value to, hospital administrators, consumers, or policymakers.

The purpose of this study was two-fold: 1) to examine the accuracy of reporting of CNM-attended births in Kentucky and 2) to explore the processes used by hospital registrars to report birth data. The study was deemed exempt by the Yale Institutional Review Board.

Methods

Aim 1: Accuracy of CNM-attended Births in Kentucky

Kentucky CNM de-identified birth logs were compared to the state vital statistics records to determine the accuracy of reporting by the hospital birth attendant. This part of the study was modeled after Biscone's et al. (2017) investigation in CNM-attended births in Texas hospitals.

Inclusion criteria consisted of licensed CNMs in the state of Kentucky who attended at least one spontaneous vaginal birth in a hospital in 2017. Exclusion criteria were certified midwives (CMs), certified professional midwives (CPMs), or lay midwives who currently cannot practice legally in the state of Kentucky and CNMs attending home births. CNMs attending homebirths were not included because of the complexity of gathering their data, since they attend births across multiple counties, and that it would be unlikely that they would not report themselves as attending the birth. The number of homebirths attributed to CNMs in 2017 was recorded as 62; therefore the omission did not affect the significance of the findings.

An email list-serve of all members of the Kentucky affiliate of the American College of Nurse-Midwives (ACNM) was compared with a purchased, comprehensive roster of CNMs licensed with the Kentucky Board of Nursing (KBN). The Kentucky affiliate list-serve had 101 names and emails, some duplicates, outdated or non-nurse-midwives. The KBN roster of CNMs licensed in Kentucky as of April, 11, 2017 was 104. The lists were combined and duplicates removed. Multiple strategies were used to assure accuracy of obtaining all CNMs in the state, including Internet searches on Google, LinkedIn, and Facebook, snowballing sampling, cold calling maternity practices and hospital birth units, and searching hospital and practice websites.

CNMs who met inclusion criteria were sent an introductory email to describe the project and to ask for their voluntary participation. The project was also presented at several Kentucky

affiliate meetings of the ACNM. They were also asked to help identify any other midwives practicing intrapartum, but who were not on the list of CNMs practicing in Kentucky. After the initial email, at least one CNM was identified from each practice in the state to keep a de-identified monthly log of attended births from January 1 to December 31, 2017. After the initial recruitment email and after verbal consent to participate, occasional follow-up emails were sent as reminders to keep monthly birth totals. Births were tracked by practice and by county.

Aim 2: Processes for Birth Certificate Data Collection

In general, the process for collecting birth certificate data includes many steps and gathers data from multiple sources. The purpose of this aim was to understand specifically the steps birth registrars take and how they verify accuracy of the birth attendant. Included in the process is the completion of two Kentucky Birth Certificate Worksheets, one by the mother and one by the facility, by nurses, providers and registrars. All data are compiled through an electronic data base called KYCHILD and that information is sent to the Office of Vital Statistics in Frankfort, the state capital of Kentucky. There, the state birth statistics are compiled and sent to the Center for Disease Control (CDC), National Vital Statistics System (NVSS). The CDC's National Center for Health Statistics (NCHS) has a manual, "Guide to Completing the Facility Worksheets for the Certificate of Live Birth and Report of Fetal Death" as well as on-line training (Center for Disease Control [CDC], 2016).

Gathering data on the processes of birth certificate data collection in Kentucky was modeled after Melnik's et al. (2015) study on barriers to complete birth registration in New York State. Their survey was adapted with their permission to reflect specific questions for Kentucky birth registrars (P. Henfield & J. Alicandro, personal communication, August 30, 2017).

The sample included birth registrars who work at a hospital in Kentucky that has births attended by CNMs and hold responsibility for collecting and recording birth registration data. The registrars were contacted by phone at the various birthing facilities. Those who provided work emails and volunteered to take the 31-item survey were emailed a cover letter to explain the nature of the survey and request voluntary participation. The registrars completed the survey using Qualtrics software, a platform for surveys and data analysis. Birth registrar survey data were synthesized and examined for common facilitators and obstacles to data collection. If any questions arose, birth registrars were called to ask follow up questions or to clarify any processes reported in the survey.

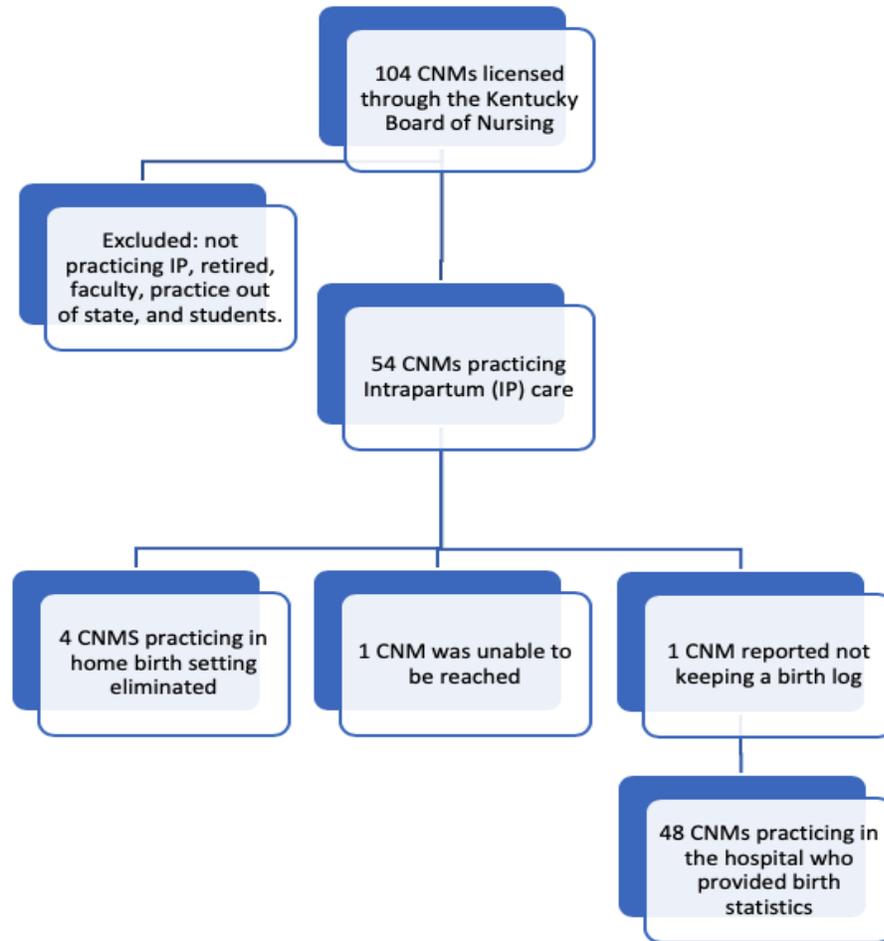
Results

The results will be described by the two aims of the study.

Aim 1

The first aim documented the accuracy of attribution of births by CNMs in Kentucky. Figure 1 provides the results of the sampling strategy. Birth certificate data were obtained from 49 midwives representing 17 of 19 counties and 24 birthing facilities (Table 1). From the KBN roster of 104 licensed CNMs, 50 CNMs were identifying as attending births in 2017, four CNMs attended home births, 18 were still in clinical practice but not attending births, faculty (7), retired (6), moved (6), and 13 CNMs were not located. Of the 50 CNMs attending births in a hospital setting, 48 provided their birth data representing 96% of the CNMs in Kentucky. One CNM was unreachable and another reported that she did not keep a birth log, therefore these two CNMs were omitted from the results. The Kentucky Office of Vital Statistics reported that the CNMs in these 17 counties attended 3595 births in 2017.

Figure 1. Sampling Strategy for Kentucky Midwives



The CNMs self-reported that they attended 4257 births. This is a 15.55% underrepresentation of midwife-attended births. Table 1 provides a comparison by Kentucky counties (county names deleted to protect privacy).

Table 1. Comparison of CNM 2017 birth logs and Kentucky Vital Statistics Records

County	Midwives' Birth Log	Vital Statistics Log	Percentage reported	Birth Registrar from this county responded to survey
1	1032	962	93.2%	yes
2	577	526	91.16%	yes
3	278	279	100.35%	yes
4	271	249	91.88%	yes
5	205	236	115.12%	yes

6	226	229	101.33%	no
7	226	196	86.73%	yes
8	187	165	88.24%	no
9	162	161	99.38%	no
10	158	159	100.63%	no
11	88	88	100.0%	yes
12	99	84	84.85%	no
13	81	78	96.30%	no
14	120*	65	54.17%	yes
15	325	58	17.85%	no
16	197	37	18.78%	yes
17	25	23	92.0%	no
Total	4257	3595	84.45%	

**Not all CNMs in that county reported births from birth log*

Aim 2

The second aim of the study explored the processes of data collection by birth registrars. The Kentucky Birth Registrar survey served to examine possible variances in processes from one facility to another that might cause inaccuracies in data collection. The survey addressed birth registrar experience and training; confidence and support in completing the birth certificate accurately, barriers and facilitators to accurate reporting, and usefulness of the Kentucky birth certificate worksheet.

Eleven birth registrars from the 24 facilities (47%) in which CNMs attended births completed the survey exploring the process of data collection for the purposes of completing the official birth certificate. These 11 registrars represented ten hospitals in nine counties. The number of CNM attended births (2991) in those nine counties represents 70% of the CNM births in Kentucky.

Across Kentucky, the dedicated number of birth registrars to any given facility ranges from one to three full time employees who work from 10 to over 40 hour per week. Birth registrars are located on labor and delivery units, postpartum units, medical records, registration

and nursing support offices. Table 2 provides information about the process of collecting and verifying birth certificate data by the registrar.

Table 2. Kentucky Birth Registrar Data collection and verification.

Survey Question	N
Birth Registrar Training	n=11
Medical or clinical background is not necessary for registrar	63.6%
Formal training for birth registrar is not provided by hospital	72.7%
Sources of information for gathering data for birth registration	n=11
<ul style="list-style-type: none"> • Hospital electronic databases 	18.18%
<ul style="list-style-type: none"> • Doctor's notes and charts (paper) 	0%
<ul style="list-style-type: none"> • Charts from various clinical program areas 	0%
<ul style="list-style-type: none"> • Prenatal records 	45.45%
<ul style="list-style-type: none"> • Interview with the mother 	27.27%
<ul style="list-style-type: none"> • Other sources 	9.09%
<ul style="list-style-type: none"> • Hospital electronic databases 	18.18%
How Birth Attendant is recorded on the Kentucky Birth Certificate	
Delivery attendant information (Item #31 on KY Birth Certificate Worksheet) is recorded by:	n=10
<ul style="list-style-type: none"> • The provider signs the KY Birth Certificate Worksheet 	0%
<ul style="list-style-type: none"> • The provider electronically signs his/her name in an electronic delivery record 	10%
<ul style="list-style-type: none"> • The provider writes it or dictates a delivery summary 	30%
<ul style="list-style-type: none"> • The RN circulating the delivery records it in the EMR 	30%
<ul style="list-style-type: none"> • Birth Attendants are written in a paper log kept on labor and Delivery 	20%
<ul style="list-style-type: none"> • Other 	10%
How often do data sources conflict for birth attendant	n=11
<ul style="list-style-type: none"> • very frequently 	0%
<ul style="list-style-type: none"> • frequently 	0%
<ul style="list-style-type: none"> • sometimes 	36.36%
<ul style="list-style-type: none"> • rarely or never 	63.64%
In the event of a discrepancy between answers for delivery attendant, registrars look to:	n=11
<ul style="list-style-type: none"> • the KY Birth Certificate worksheet 	0%
<ul style="list-style-type: none"> • in the EMR delivery record 	72.73%
<ul style="list-style-type: none"> • The log book at the nurse's station 	9.09%
<ul style="list-style-type: none"> • On the baby's crib card 	0%
<ul style="list-style-type: none"> • Whoever is listed as the attending in the medical record 	0%
<ul style="list-style-type: none"> • Whoever the mother says attended the delivery 	9.09%
<ul style="list-style-type: none"> • Other (Check with RN/MD/DO/CNM who cared for patient) 	9.09%
In the event that a CNM or MD/DO misses a delivery and the RN/Father, EMT or other person attends the birth, do you record his/her name as the attendant?	n=11

• yes	54.55%
• no	0%
• if not, who do you record?	20%
• Attending on call	20%
• Note homebirth, car birth, etc	20%
• The MD on the delivery record	20%
• The name of the physician that missed the delivery	20%
• Unattended delivery	20%
The primary sources for delivery attendant	n=11
• the KY Birth Certificate worksheet	18.18%
• in the EMR delivery record	45.45%
• The log book at the nurse's station	18.18%
• On the baby's crib card	0%
• Whoever is listed as the attending in the medical record	9.09%
• Whoever the mother says attended the delivery	0%
• Other (Check with RN/MD/DO/CNM who cared for patient)	9.09%
• Meetings are held between medical/clinical staff and the Birth Registrar to address birth data that are missing or inconsistent	0%
• Supervisor manager reviews data prior to or following entry into the electronic birth registration system	15.38%
• Audits are conducted to compare the birth registration data with medical record data for a sample of births	7.69%
• Continuing education and/or training opportunities are provided to improve data quality	23.08%
• None	46.15%
• Other (please specify) not formal meetings, but communication between birth registrar and medical/clinical staff	7.69%
Verifying Accuracy	n=11
Providers (OBGYN, MFM or CNM) do not verify the birth certificate worksheet	90.9%
Does the hospital have a designated individual whose role it is to confirm the accuracy and completeness of the information collected?	n=11
• Yes	27.27%
• no	18.18
• please specify	
• a second clerk checks for errors	36.36%
• it is the responsibility of everyone who has access to KYCHILD	9.09%
• triage (?)	9.09%
Which of the following are performed to improve the accuracy and completeness of the information for birth registration?	n=13
• Meetings are held between medical/clinical staff and the Birth Registrar to address birth data that is missing or inconsistent	0%
• Supervisor manager reviews data prior to or following entry into the electronic birth registration system	15.38%
• Audits are conducted to compare the birth registration data with medical	7.69%

record data for a sample of births	
<ul style="list-style-type: none"> Continuing education and/or training opportunities are provided to improve data quality 	23.08%
<ul style="list-style-type: none"> None 	46.15%
<ul style="list-style-type: none"> Other (please specify) not formal meetings, but communication between birth registrar and medical/clinical staff 	7.69%
<hr/>	
Does your hospital do any of the following to facilitate birth registration? (Please choose all that apply)	n=23
<ul style="list-style-type: none"> Clinicians are required to complete a single standard form (paper or electronic) that includes all medical information required for birth registration 	25%
<ul style="list-style-type: none"> Reports are generated from the hospital electronic data system that include all necessary medical information for birth registration 	18.75%
<ul style="list-style-type: none"> Clinicians are educated on the importance of providing complete and consistent information in the patient medical records 	31.25%
<ul style="list-style-type: none"> none 	18.75%
<ul style="list-style-type: none"> other 	6.25%
<hr/>	
Do you use health department or electronic birth registration system reports to monitor the quality of the data prepared and entered for birth registration?	n = 10
<ul style="list-style-type: none"> yes 	60.6%
<ul style="list-style-type: none"> no 	0.0%
<ul style="list-style-type: none"> I am unaware of any system to monitor quality 	40%
<hr/>	
Facilitators to Accurate Reporting	
Have there been any recent specific improvements that have made your job easier or more efficient?	n=8
<ul style="list-style-type: none"> no 	87.5%
<ul style="list-style-type: none"> Adding someone to “proof-read” and verify information on birth certificate worksheet 	12.5%

The registrars were also asked to describe barriers or challenges to collecting birth certificate data. The results and portrayed in Table 3.

Table 3. Barriers to Accurate Reporting of Birth Certificate Data

Have you encountered any of the following challenges in collecting accurate birth certificate data (yes/no) – (use comment box if needed to provide an example).	Major Barrier %	Minor Barrier %	Not a barrier %	n
<ul style="list-style-type: none"> Medical/clinical staff do not provide complete information in their notes and charts 	18.18	63.64	18.18	11
<ul style="list-style-type: none"> birth data are located in multiple systems and or obtained from multiple sources 	18.18	45.45	36.36	11
<ul style="list-style-type: none"> conflicting birth data information is contained in different sources 	9.09	36.36	54.55	11
<ul style="list-style-type: none"> There is a need for continuing education and training 	0.0	36.36	63.64	11

Running Head: CNMs as ATTENDANTS in BIRTH REGISTRATION DATA

■ Staff resources are inadequate	0.0	27.27	72.73	11
• There is a need for improved hospital electronic data systems	0.0	36.36	63.64	11
■ Information recorded in the forms is not legible	9.09	54.55	36.36	11
• Data from the mom's prenatal records is unavailable or incomplete	30.00	20.00	50.00	10
■ Electronic birth reporting system help tabs and/or documentation are inaccurate or out of date	0.0	0.0	100.0	10

Birth registrar training. Most of the registrars (63%) reported that no medical or clinical background was necessary for the position. Two respondents cited CPR and electronic medical record (EMR) training as “medical” training. Only one respondent listed the Kentucky Birth Registrar Online training as their “formal” training. Most registrars (72%) stated that the hospital did not provide formal training.

Barriers to accurate reporting. Most registrars (90%) did not think that providers verified the birth certificate worksheet. Registrars look primarily to doctor's notes, prenatal records, the interview with the mother and the EMR as their sources for completing the birth certificate. Simultaneously, registrars indicate that a major barrier to accurate reporting is that prenatal records are often incomplete or missing. The majority of registrars (54%) reported that nothing was done at their facility to improve the accuracy of reporting birth certificate data. The five most frequent responses given for barriers to collecting accurate data were: medical staff do not provide complete information, birth data are located in multiple systems or obtained from multiple sources, conflicting birth data information is contained in different sources, information in forms is not legible and that prenatal records are not always available and are often incomplete. Nine different EMRs were identified among eleven different respondents.

Facilitators to verifying accuracy. All of the registrars reported that there was usually no conflict among different data sources on who was the birth attendant. Most registrars reported

that they do have someone whose role it is to confirm the accuracy of the collected data. To improve accuracy of reporting, 27% said that a supervisor or manager reviews the data.

Inconsistencies in survey responses. Answers to the survey indicate a discrepancy in training from facility to facility as well as a lack of a uniform data collection process. When asked how long registrars have to get their data to the health department, there were seven different answers ranging from unsure to one month. All birth registrars were asked to describe the data collection process. As many as 22 individual steps were identified from the time the neonate is born until the birth certificate worksheet is printed and mailed to the Office of Vital Statistics and are described in Table 4.

Table 4. Individual steps to complete birth certificate worksheet identified by birth registrars

Step	Action
1	Call is received that the baby is born
2	We register the baby as inpatient (get Medical record number)
3	Obtain list of births from L&D
4	Check L&D birth log for route of delivery, weight, length, APGAR, attendant name, complications
5	Look at prenatal records, mom's chart, medical history for answers to as many questions as possible
6	Mom is given a Birth Certificate worksheet based on the official one provided by the Vital Statistics Office to complete (with the baby's name, mother's personal information, and father of baby's personal information)
7	A worksheet is filled out by the registrar containing information found in the perinatal records and birth information entered by the RN/ receive "Facility – Birth Certificate Worksheet" from labor hall
8	Another form is completed by the doctor regarding the baby's health after birth
9	Mother is interviewed: verify name, address, DOB, follow up pediatrician, level of education, breastfeeding or bottle – and other personal questions
10	Paternity affidavit offered if applicable
11	Notarize any (VS-8B) Voluntary acknowledgement of paternity
12	Fill out footprint card and give it to the parents which serves as a temporary birth certificate so that they can insure their child or apply for any assistance they qualify for
13	Fill out Message from Social Security which lets the parents know when they should be receiving their child's social security card.
14	All information is compiled together in the state KY CHILD data base for the creation

	of the baby's birth certificate
15	A birth certificate draft/form is printed of what will appear on the birth certificate
16	Mom and Dad proofread the draft
17	Mother is required to sign and date worksheet as this serves as her permission to release the child's social security number to the Office of Vital Statistics and the department of education
18	Birth certificate draft checked by another person
19	Changes are made
20	The file is saved and finalized
21	A final copy is printed on linen paper and sent to the (Child's County of Birth) County Health Department
22	Print and mail to Frankfort

Birth attendant. When asked how the delivery attendant is identified (item #31 on the birth certificate worksheet) and recorded, the majority reported looking at the provider's delivery summary or the EMR. None reported looking at the KY birth certificate worksheet. Birth registrars indicated that they are looking at the provider's delivery summary or the EMR for the birth attendant.

Discussion

Aim 1

The results of this study show that births attended by Kentucky CNMs are underreported by 15.55%. This is reflected in the discrepancy between the KY vital statistics records of 3595 CNM hospital attended births as compared to the CNMs self-reported birth logs which total 4257 births attended in 2017. This 15.55% is a conservative estimate since the vital statistics record also attributes 49 hospital births to "other midwives." There is no instance in which "other midwives" would be attending births in a hospital setting in Kentucky. These are likely misattributed to a CNM or student CNM. In addition, two CNMs did not provide birth logs and were omitted from the total. One of those CNMs was in county 14 where her partner listed 120 births attended while vital statistics only has 65 births attended by CNMs.

Biscone et al. (2017) found that Texas midwives were underreported by 65%. This underrepresentation is attributed to several different causes including: hospital policies in which physicians are named as birth attendants for CNM-attended births, CNM practices not receiving a report from the hospital on the number of births attended to verify accuracy, and that nonclinical hospital staff are responsible for accurately reporting CNMs as providers for CNM-attended births. While Kentucky's CNMs were better represented than the Texas midwives, 15.5% is a significant underrepresentation of CNMs to effect policy changes, funding and representation in national statistics. Like Texas midwives, Kentucky midwives are reliant on nonclinical birth registrars to accurately attribute CNM-attended births to them in national statistics.

Examining the Kentucky 2017 births by county illuminates the likeliest greatest cause of underrepresentation - birth registrar inaccuracies. If the two counties with the greatest underrepresentation of CNM birth attribution (county 15 & 16) are removed from the table, then the underrepresentation of midwives drops to only 7%. $(\text{CNM birth logs } (3735) / \text{Vital Statistics } (3500) = 93\%)$. This would suggest that by collecting statewide data by county, discrepancies in data collection could be pin-pointed to specific facilities. This would allow the state office of Vital Statistics to target re-education efforts toward birth registrars in specific facilities as opposed to mounting state-wide re-education, which would be costly and not necessary. Focused training and quality improvement efforts even in just two facilities with the worst recording percentages would greatly improve the overall accuracy of state data given to the CDC.

Aim 2

Knowing that the accuracy of state and national statistics largely filters down to the performance of a single birth registrar in a facility, it is important to gain insights into what

barriers there are to accurate reporting. The results of the KY Birth Registrar survey largely support the Melnik et al. (2015) survey findings and raise questions on the accuracy of the data collected on the Kentucky Facility Birth Certificate Worksheet.

The survey results shed light on possible solutions to process problems. The Kentucky Office of Vital Statistics state registrar should insure that all current and future birth registrars are familiar with the NVSS facility worksheet training manual and should participate in the on-line training module. In addition, as mentioned by Biscone et al. (2017), CNM practices should be requesting from the hospital a report on the number of births that have been attributed to midwives in that practice. Midwives can then compare to their own birth logs and verify accuracy. If a discrepancy is noted, they can address this with the hospital registrar and work to identify the source of the error.

All of the registrars reported their ability to properly identify the birth attendant as “always able,” yet there is a 15.5% underrepresentation of CNMs on birth certificates. They reported that there is rarely a discrepancy on who the birth attendant was, but if there were, 81% would look to the EMR for the “correct” answer. No respondents identified that they would look to the Kentucky birth certificate worksheet for this information. One registrar reported that he/she would record whoever the mother stated was the attendant in the mother interview. This is problematic since some women may not know who the provider was if it was a practitioner she has never met, such as a laborist/hospitalist or another provider in the practice. When the medical provider misses their client’s birth, the registrars reported listing the attending on call, the physician name on the delivery record, or marking unattended delivery or homebirth, car, nurse, etc. While CNMs are encouraged to ensure that their name is listed on the birth certificate

worksheet, if the registrars are not looking to that as a primary source, then CNMs should also be verifying that their name is listed in the EMR delivery summary.

In a follow up interview with one of the registrars, she stated that she received a call from the county registrar to ask her if it was true that no nurses delivered babies at that facility in the prior year. It is highly unlikely that 100% of births were attended by a CNM/MD or DO and that there were no precipitous births necessitating a nurse to attend the delivery. Upon further investigation, it seems that the practice at this facility is that when a mother is admitted, the labor and delivery nurse proceeds to complete the Kentucky Birth Certificate Worksheet prior to delivery. The RNs are apparently completing item 31, birth attendant, with the mother's prenatal care provider – regardless of whether that provider actually attends the delivery. This would imply that not only are CNM's underrepresented as attendants, but potentially nurses and laborists/hospitalists as well.

The complexities of birth certificate data collection are evident in the birth registrar responses. A respondent who identified her position as "Nurse Manager" filled in the birth registrar role while hiring a new registrar wrote that data collection was extremely time-consuming. Before having to perform the duties herself, she was considering eliminating the position. She said she now understands that staff RNs cannot fill in this role and that if the registrar is rushed, it is easy to make mistakes. She has now allotted a full-time equivalent position for the registrar role. Careful consideration of the time required to accurately complete birth certificate data should be taken by hospital facilities.

There are several potential solutions to the concerns about birth certificate data, including standardization of data collection processes, increased funding for quality improvement and training, improvement in prenatal care record keeping, increased education, specific changes to

the birth certificate itself, streamlined and linked technology, and targeted suggestions for nurse-midwives. A comparison of hospitals identified the problem of data collection including varying protocols in different hospitals (DiGiuseppe et al., 2002) to collecting medical records from multiple departments (Northam & Knapp, 2006). Many of the other authors echo these same concerns and elaborated on specific problems. Zollinger, Przybylski, & Gamache (2006) and Northam & Knapp (2006) point to problems with lack of standardization with prenatal records and lack of understanding with hospital personnel that could be improved with increased training (Paine et al, 1988). Many authors spoke to the need for improvements in technology to help reduce gaps in error, missing information and misinformation (Diers, 2007 & Zollinger et al., 2006). Paine et al., (1988) recommended that the person who provided prenatal care complete the birth certificate worksheet as best as possible prior to delivery and that midwives should familiarize themselves with their state's vital statistic registration policies. They also recommended that midwifery education programs teach their students the importance of verifying birth certificate data. An overall consensus suggested that all midwives keep accurate birth logs in a centralized electronic data base (Walker et al., 2008; Melnik et al., 2015; Northam et al., 2003). In addition, there is a need for clarification of the definition of birth attendant (Walker et. al., 2008). Diers (2007), Melnik et al., (2015), Walker et al., (2008), Zollinger et al., (2006) and Howland et al., (2015) all call for standardization and linkage of electronic medical records with birth registration systems. Dietz et al, (2015) recommended funding for quality improvement in state vital statistics agencies.

Strengths and Limitations

Strengths of this study include the high response rate from the Kentucky CNMs of 96%. One limitation of this study is that it relies on CNMs to self-report their SVDs for 2017 which could

be inaccurate. While the birth registrar survey represented 47% of the counties where CNMs attend births, it was a relatively small sample of birth registrars with an n= 11. However, of the birth registrars that responded, they provided excellent and thorough information.

Conclusion

Midwives need to be part of the solution to accurate birth certificate reporting. The first and most basic step is that midwives need to keep track of births they attend. For many midwives, this is not currently part of their habit or routine. Several CNMs reported being too busy to keep statistics. Easy and convenient ways that CNMs can track their births that fits with the lifestyle of a busy midwife need to be explored. A simple smart phone application could be designed to track vaginal deliveries attended could be a solution. The ACNM and midwifery programs could also emphasize that keeping a birth log is a crucial step in attending births. In the same way that the ACNM and midwifery programs emphasize precepting midwifery students, they could also reiterate that keeping birth statistics is the responsibility of every midwife practicing intrapartum care.

As a profession, midwives can also encourage students to research attribution of births to midwives in their state. The ACNM's Improving Midwifery Birth Numbers Initiative (IMBUE) is a project under the umbrella of the American College of Nurse Midwives' (ACNM) Division of Research Data Management. The project is a partnership between interested students and faculty to replicate a similar study in their states. The purpose of IMBUE is to "identify the amount of underreporting of CM/CNM birth numbers in the national birth certificate data." The goal is to conduct a thorough study in all 50 states. (Tilden E., personal communication, May 23, 2018).

The implications of this project are far-reaching. Over the last decade, there has been a gap in data about attribution of births to CNMs until Biscone's et al., (2017) study that reviewed Texas birth registration reporting. Midwifery scope of practice and autonomy varies from state to state, thus it is necessary to examine data from states on an individual basis. What may be a problem in one state, may not be a problem in another and vice versa. Until more midwives investigate accuracy of birth registration reporting, there will be gaps in knowledge. However, as more and more data are collected and awareness increases as to the inaccuracies in reporting of birth attendant, the need for quality improvement initiatives will grow in demand. Presenting findings from Texas and Kentucky at national conventions will help increase awareness. CNMs will be able to take QI suggestions back to their home states and facilities and begin to encourage change. DNP and other midwifery leaders can help disseminate the knowledge to the heads labor and delivery departments, to the offices of vital statistics and to the birth registrars at their own facilities. Educators and preceptors can emphasize accurate reporting as they teach the next generation of midwives. Until CNMs are able to prove how many births they are attending, the profession will be stunted in its ability to advocate for policy change, 100% reimbursement, funding or practice autonomy. Through accurate statistics, CNMs have the potential to demonstrate their value to the health care system through decreased costs, improved outcomes and increased patient satisfaction. Just as Mary Breckinridge taught her midwives on horseback to keep accurate statistics, so too do the modern-day midwives, adept with technology and electronic health records, need to understand the significance of accurate data collection.

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Conflict of Interest

The authors have no conflicts of interest to disclose.

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