Recommendations to Improve the Accuracy and Quality of Indiana Birth and Death Certificates

Indiana Perinatal Quality Improvement Collaborative

Endorsed by the IPQIC Governing Council
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Quality Improvement Committee

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Overview

In March 2013, the Indiana Perinatal Quality Improvement Collaborative (IPQIC) Data Committee was charged to support state and local efforts to improve perinatal outcomes in Indiana through the establishment of the Indiana Perinatal Data System. The Data Committee was also established to facilitate the accurate collection of data and analysis of data needs for the IPQIC. The Data Committee was to work with the Quality Improvement Committee to coordinate collection of population data and Quality Improvement Project Data. The Data Committee and members of several other committees identified that the lag in receipt of birth and death certificate information at the Indiana State Department of Health (ISDH) handicapped the rapid analysis of infant birth and death data. In addition there were known to be problems with the quality of data reported, and missing data on the birth and death certificates. Therefore, a new Birth and Death Certificate Subcommittee of the Quality Improvement Committee was formed.

Goal

The initial goal of the Birth and Death Certificate Subcommittee was to implement a quality improvement project to improve the timeliness and accuracy of the Indiana birth and death certificates. Although it quickly became apparent that implementation of a quality improvement (QI) project was beyond the scope of current resources, moving forward with the first steps in such a project (i.e. gathering baseline data, process maps, and best practices) might lead to a greater understanding of the issues and allow the development of initial recommendations for improving the Indiana birth and death certificate processes. The goal of the sub-committee was to systematically gather data and to provide initial recommendations for the improvement of timeliness, completeness, and accuracy of the data.

Data Sources and Methods

This report summarizes our findings from five data sources: 1) review of the literature; 2) review of Indiana's existing forms, data entry systems, and web-based training modules; 3) one-on-one interviews with a funeral home director and neonatologist who are experienced with the death certificate process; 4) interview and/or survey of those responsible for filling out the birth certificate at five of the major birthing hospitals in the state; 5) review of other state's best practices; and 6) review of state data including the Indiana 2013 Revised Natality Statistical Report from the Centers for Disease Control and Prevention (CDC) , which includes the number of births and deaths from birth certificate data, and Lag Analysis and Indicator Frequency data from the Data Committee. We also developed process maps for better understanding of the birth and death certificate processes. Finally, the preliminary findings and recommendations were presented at the ISDH Labor of Love Infant Mortality Summit, where the session was attended by over 40 people who gave feedback regarding the findings and their experiences.

Findings

We briefly summarize the findings from each of our sources below.

Literature Review

Two recent reports highlight the challenges and strategies in obtaining quality data. The first report, called *More, Better, Faster, Strategies for Improving the Timeliness of Vital Statistics*, was published in 2013 by the National Association for Public Health Statistics and Information Systems (NAPHSIS). NAPHSIS represents the 57 vital records jurisdictions in the United States (U.S.) responsible for collecting birth and death data. NAPHSIS partnered with the Anne E. Casey Foundation (AECF) to document challenges in vital statistics processes.

The NAPHSIS report identified several factors that slow the flow of data including financial capital, human capital, and political capital. The current fiscal climate has decreased monetary resources available for modernizing data systems and operations of state vital statistics departments. Staffing shortages and high turnover among data providers and vital records offices impact the timeliness of the data. The limited capacity of information technology (IT) personnel due to competing IT priorities within the state or local health department delays the modernization of vital records systems and roll-out of electronic systems (National Association, 2013). In many states, vital records operations and infrastructure improvements are a low political priority compared to those competing needs with more vocal constituencies. Without strong leadership within the vital records offices to champion the importance of vital statistics within the state, these data are often taken for granted. Similarly, without a champion to educate external partners (e.g. hospital birth clerks, funeral home directors, and physicians) who are critical to the process, these partners do not realize the value of vital statistics and are thus not vested in efforts to enhance data quality and timeliness (National Association, 2013).

The report identified several short term strategies to improve timeliness and accuracy of data, which centered on professional development, to enhance performance of data providers and vital statistics leadership by:

- Enhancing communication about the importance of data and ways to prevent data errors
- Increasing opportunities for continuing education
- Training and mentoring to cultivate new leaders

NAPHSIS and the CDC's National Center for Health Statistics (NCHS) established a Birth Data Quality workgroup to address birth data quality issues in 2014 (Ahuja et al., 2014). They conducted an online survey that was completed by 46 of the nation's 57 jurisdictions (88%). This second report stated that most jurisdictions (82%) provided data collection

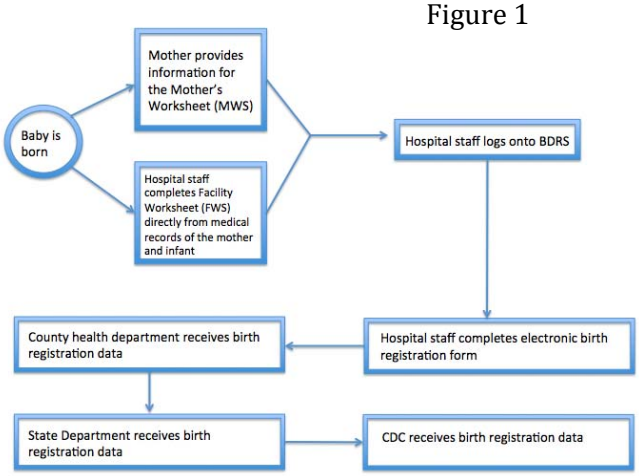
worksheets using the same content as the U.S. standard worksheets developed by NCHS. About half (52%) of the jurisdictions provided data completeness reports to birth hospitals, and most (89%) of the jurisdictions provided feedback on logic checks. Audits were rarely utilized for ongoing data quality monitoring, and performance reports were rarely directed to upper-level hospital staff. Over half of these jurisdictions reported being understaffed for birth certificate data quality activities (Ahuja et al., 2014). Direct feedback resulted in improvement in future hospital data quality. Recommendations based off this feedback were to support greater cooperation between birth registration and birth statistics staff, better adherence to standardized collection instruments, and increased and timelier evaluation of vital records for data quality (Ahuja et al., 2014). Specifically,

1. Data must be evaluated on an ongoing basis
   - Continuous, direct feedback provides the greatest improvement in future hospital data quality
   - Recommend quick response to poor data quality from birth facilities – weekly or monthly vs. quarterly or yearly
2. Effective communication of data quality is necessary
   - Concrete feedback
   - Increase awareness about the merit of data quality
   - Provide regular trainings and newsletters
   - Publish reports about performance to increase transparency
   - Connect with upper-level clinicians and hospital administrations

Process Mapping

The subcommittee members mapped the birth and death certificate process using data from three sources:
1) Review of Indiana's existing forms, data entry systems, and web-based training modules; 2) One-on-one interviews with a funeral home director and neonatologist who use the death certificate process; 3) Interview and/or survey of those responsible for filling out the birth certificate at five of the major birthing hospitals in the state. .

Figure 1



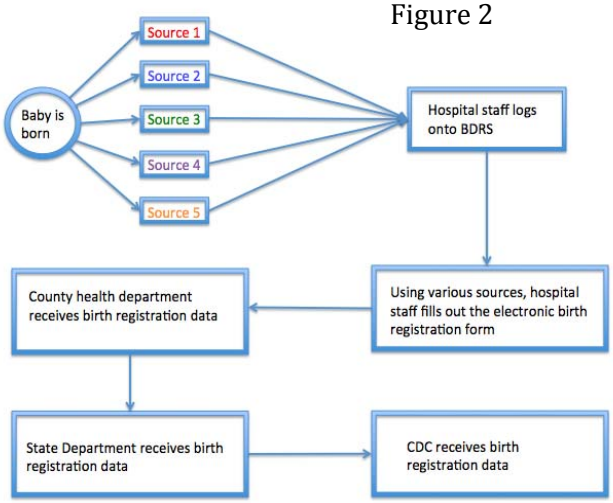
Birth Certificate Process

The theoretical process for completing a birth certificate is depicted in the process map in Figure 1. A worksheet provided by ISDH/NCHS assists clerks in completing the birth certificate and contains 12 pages (Appendix A). First

the mother fills out the Mother's Worksheet section (MWS) of the NCHS-issued 12 page birth certificate form, and the hospital staff fills out the Facility Worksheet section (FWS) of the form. Second, the hospital staff logs onto the Indiana Birth Registry System (IBRS), also known as Genesis. Third, hospital staff uses the completed worksheets to fill out the electronic birth registration form in the IBRS. Fourth, the local health department receives birth registration data and; fifth, the local health department forwards the data to ISDH. Finally, ISDH forwards the data to the NCHS.

Our study focused on the early process of collecting and entering the data into the IBRS. The actual process, which is shown in Figure 2, is much more complex than the theoretical process. The individuals who collect the data and the sources used to identify the information vary by location. Data for the worksheets and/or IBRS may come from as many as five electronic and paper sources. As a result, data, such as the number of prenatal visits, may be under-reported. This was especially apparent if the patient was transferred from another hospital during her pregnancy.

Figure 2



The largest hospitals may have as many as 300 births per month. Depending on the ease of finding the data, a birth certificate can take from 15 minutes to an hour and a half to complete. If there are no interruptions or other responsibilities, an experienced person can enter as many as 10-20 births into the IBRS daily.

Obstacles faced by the hospital staff include:

- Variation in who is collecting the data - for example, two different approaches observed were 1) the clerk doing the actual interview and then inputting the data and 2) nurses (or other staff) collecting information and turning it over to the clerk for data input.
- Missing data - takes time to find sources of missing data and/or contact the mother for information.

- Variation in data sources (multiple online and/or paper) – sometimes data sources conflict and it is unclear which source has the correct information.
- Availability of external data – for example, prenatal care may have begun with a different hospital/health care professional and then transferred, but the birthing hospital may only have data available from their system.
- To simplify the process, hospitals have changed the 12 page worksheet. They may have divided the FWS into several forms. Some hospitals made changes to the questions and answer choices – for example, they used a non-standard response for "Mother's Race," leading to anomalies in the data.
- One part of the process that is not represented currently on the process map is the Paternity Affidavit. This was consistently named as a problematic area on the birth certificate survey and during the presentation discussion at the Labor of Love Infant Mortality Summit. Workshop participants noted: 1) "…the father's information section- if he is not there or mother does not have information- the father information is not in the [prenatal] history. Sometimes fathers do not show up until the last minute for the paternity affidavit." 2) "The average for a [birth certificate that requires] paternity [affidavit] is 40-45 minutes [double the time] depending on how many correction or changes were needed." 3) "Often there is a problem with the father not having a picture ID."
- Data inaccuracies – one birth clerk was observed during the process and several inaccuracies were noted. First, if a field such as "Father's Employment" is marked unknown, there is apparently an edit that will kick the birth certificate back to the hospital. One clerk put "unemployed" rather than unknown to avoid getting the kick back message since the mother had already gone home. Another common mistake is assuming the race of the mother, rather than asking.

Staff Roles and Training on IBRS

Birth certificate clerks from the larger birth hospitals were generally hired to do other jobs, then moved into their role with birth certificates. Their training was primarily "on-the-job," along with the state training when the new IBRS was started several years ago. Some had used the state's training modules, while others visited the website after our question was raised in regard to the modules, and stated they would use it in the future for new trainees. Generally, the birth certificate clerks have additional responsibilities such as processing newborn screening, ordering supplies, stocking supplies, helping out on the floor when needed, and covering for OB clerks/receptionists.

We reviewed the Vital Records Training Modules located at http://in.gov/isdh/25584.htm. The training consists of three modules which take approximately 30 minutes to complete:

- Module 1: Improving the Quality of Birth Certificate Data
- Module 2A: All Birth Worksheet Data Matters Part A

- Module 2B: All Birth Worksheet Data Matters Part B

The modules were easy to use, but there was no certificate of completion or continuing education credits associated with completion.

Death Certificate Process

There are several steps in entering the death certificate data into the Indiana Death Registration System (IDRS). A process map indicating these steps can be seen in Figure 3.

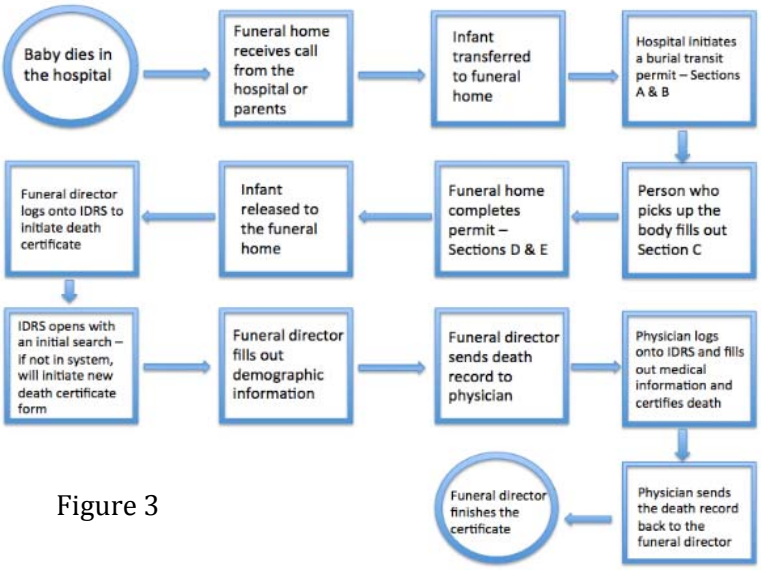
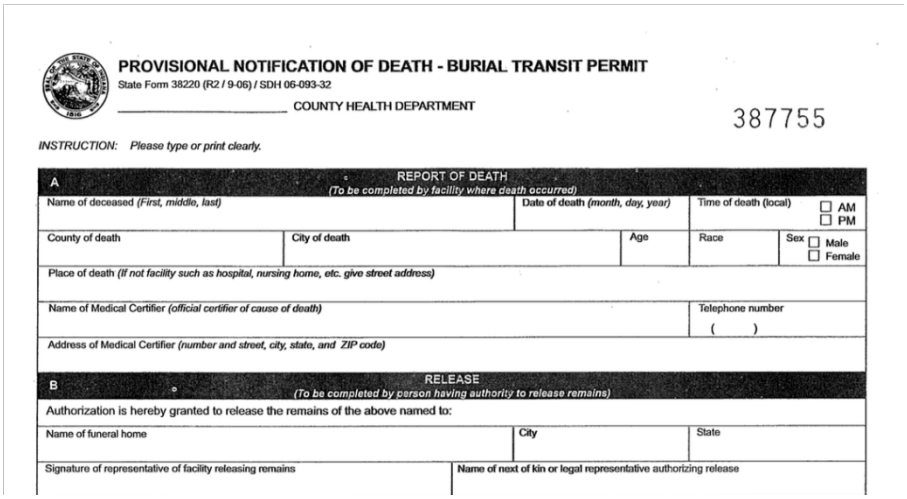


Figure 3

1. A funeral home receives a call from the hospital or the parents.

2. If the parents decide to use their funeral services, the infant will be transferred to the funeral home.

3. The hospital initiates a burial transit permit by completing Sections A & B of the Burial Transit Permit (BTP).



PROVISIONAL NOTIFICATION OF DEATH - BURIAL TRANSIT PERMIT

State Form 38220 (R2 / 9-06) / SDH 06-093-32

_____ COUNTY HEALTH DEPARTMENT

387755

INSTRUCTION: Please type or print clearly.

A — REPORT OF DEATH *(To be completed by facility where death occurred)*

Name of deceased *(First, middle, last)*		Date of death *(month, day, year)*	Time of death (local)	☐ AM ☐ PM
County of death	City of death	Age	Race	Sex ☐ Male ☐ Female
Place of death *(If not facility such as hospital, nursing home, etc. give street address)*				
Name of Medical Certifier *(official certifier of cause of death)*			Telephone number ( )	
Address of Medical Certifier *(number and street, city, state, and ZIP code)*				

B — RELEASE *(To be completed by person having authority to release remains)*

Authorization is hereby granted to release the remains of the above named to:

Name of funeral home	City	State
Signature of representative of facility releasing remains	Name of next of kin or legal representative authorizing release	

4. The person who picks up the body fills out Section C of the BTP.

C — **BURIAL - TRANSIT PERMIT**
(To be completed by funeral director or representative)

I, representing _____ (*name of funeral home*) _____ (*city*) _____ (*state*) _____ (*telephone number*)
hereby accept the remains of the above named and agree to secure and file a complete certificate of death within the time limit established by law.

Signature of funeral director or representative	Printed name of Indiana Licensed Funeral Director	Indiana Funeral Director License number

A certificate of death having been filed or a provisional notification of death received as required by law, permission is hereby given for transportation and disposition of the remains - except for cremation which requires a completed certificate of death.

Signature of Health Officer	Local number	Date filed *(month, day, year)*

5. The funeral home completes the BTP by filling out Sections D & E.
   Three copies of this permit are made and sent to:
   1. Local health department
   2. Crematory or cemetery
   3. ISDH

D — **RESIDENCE**
(To be completed by funeral director)

Last known county of residence	Last known address of deceased *(number and street, city , state, and ZIP code)*
Address(es) two (2) years prior to death *(if different)*	*(number and street, city, state, and ZIP code)* *(number and street, city, state, and ZIP code)*

E — **DISPOSITION**
(To be signed by sexton of cemetery or representative of crematory)

Name of cemetery / crematory	Date of disposition *(month, day, year)*	Date of cremation *(month, day, year)*
Place of disposition *(City, county, state, and ZIP code)*		

Method of disposition *(check all that apply)* ☐ Burial ☐ Cremation ☐ Entombment ☐ Inurnment ☐ Removed from State ☐ Donation ☐ Scattering *(location)* _____

Cremains returned to :	Funeral Director	Family	Cemetery

Signature of sexton or crematory representative	Date *(month, day, year)*

DISTRIBUTION: White copy - Health Department copy to accompany the body to its disposition. Must be signed by the sexton of the cemetery or the representative of the crematory, and returned to health department in the county where the death occurred within two (2) days after burial or cremation. Copies may be made for faxing. Contact local health department for out-of-state shipment.
Canary copy - Cemetery/Crematory copy for their records.
Pink copy - To be mailed by the facility where the death occurred to the local health department within twenty four (24) hours following death. Copies of the white form may be made by the facility for its' records and for faxing in lieu of mailing.

6. The infant's body is released to the funeral home by the hospital; release can be verbal or written, but it varies by hospital.

7. The funeral director logs onto IDRS to initiate the death certificate. This generally occurs within 24-48 hours, but may take longer if the funeral home is waiting for the mother's release from the hospital.

8. IDRS opens with an initial search:
   - If the name is already in the system, it will match the name to the search
   - If a similar record is already in the system, it will prompt the funeral director to double-check information, then either select an existing record or create a new record
   - If the name is not in the system, it will initiate a new death certificate form

9. The funeral director fills out demographic information with data collected from interviewing the parents. Once the funeral director has gathered the information from the parents, the information is entered into the IDRS. It takes about 10 minutes if the deceased was the product of a live birth (and therefore has much of the data already available), and about 20 minutes for a fetal death to be entered into the IDRS.

10. The funeral director sends notification of a death record to the physician; however, the physician must be registered in the IDRS.

- Physician will receive an email notifying him/her that a death certification is in queue
- Email includes decedent's name, date and time of death, place of death, funeral home initiating requesting certification, and funeral home contact information

11. The physician logs onto IDRS and fills out medical information and certifies the death.

12. The physician sends the death record back to the funeral director and the funeral director receives a similar email notification.

13. The funeral director verifies demographic information and submits the certificate to the local health department.

Fetal deaths are registered in a separate system with the key difference being that the fetal death report requires more parent demographic information because no live birth certificate data are collected. Also, if the fetus is less than 20 weeks gestation, the funeral home does not report and the hospital disposes of the fetal remains. A recent law, however, allows parents to request a burial of fetal remains at less than 20 weeks gestation. There are reports that the release and disposition of the tissue to the funeral home is, at least in some areas, now forcing completion of a death certificate, but lacking a live birth certificate. It is unclear at this time how many parents will opt for this option and how the data will be reconciled.

Several challenges and barriers exist with the death certificate process:

- Email from funeral directors to physicians may land in spam, leading to repeated contact attempts and loss of time
- Physicians not registered into the IDRS cause delays
- Wrong physician name on the transit record slows down the process
- Fetal death record takes a long time, with the interview and data entry taking up to an hour to complete
- Switch to electronic records and lack of training may be causing delays. Physicians used to have a stack of forms that they filled out after a death, including information for the death certificate; now the hospital's electronic health records (EHR) processes are separate from the state electronic processes, so physicians do not immediately fill in the information, when data are likely to be most accurate and timely.
- Physicians are unaware that they have the option to initiate the death certificate themselves at the time of death
- Other hospital personnel can also start the death record (if they are registered with the system), and the physician would just need to sign in with their personal

identification number (PIN) to verify the information; but this was unknown to hospital staff.

- Obtaining information on birth and death certificate data across state lines is a challenge
- The current reporting system from the hospital to the funeral home is a bit cumbersome, and requires many different approving channels, causing a lag in time and possible loss of valuable data.

Death Certificate Training and IDRS

Online training and training manuals are available on the Indiana government website: https://myweb.in.gov/ISDH/IDRSThin/. At first an old website was found more easily than a newer, updated website. Indiana's training manual is 68 pages long and the CDC's training manual is 65 pages long. Although the information is technical and dry, there is a power point presentation and a "quick guide" that are user friendly. The IDRS itself is not totally intuitive in its navigation and there are no "help" buttons surrounding the fields. However, drop down boxes are available for many of the fields.

State Best Practices

Several states have begun to address concerns about their vital statistics timeliness, accuracy, and completeness. We outline below several examples currently being implemented by other states.

A. Ohio

In April and May 2010, the Ohio Department of Health Office of Vital Statistics (ODH/VS) conducted sixteen site visits to maternity hospitals to assess gestational age calculations, number of prenatal visits, and data collection practices documented in the birth certificate. Each facility was asked to provide three pre-defined medical charts for review to compare to the information that had been entered into the Integrated Perinatal Health Information System (IPHIS) (Ford & White, 2012). They found problems similar to those that we have outlined above in the Indiana processes: data discrepancies, incorrect use of the mother's and facility worksheets, data quality issues, and complexity of data collection. Seven of the sixteen facilities had at least one discrepancy (44% inaccuracy) between the medical record and the information entered into the IPHIS application due to human keying error or data collection. Approximately half of the sites did not use the provided Facility Worksheet, either creating their own worksheet or using a worksheet derived from their facility's EHR. In this study, data quality and skill level of the staff members who were gathering the IPHIS application information seemed to be correlated (Ford & White, 2012). Facilities that used statistical or nursing staff, as opposed to medical records clerks, had more complete and accurate data. Two areas of incorrect data were noteworthy: the number of maternal prenatal visits and the gestational age of the newborn. Finally, as in

Indiana, staff at surveyed facilities reported the need to access as many as five different databases, forms, and/or charts to obtain required IPHIS application information. Inter-system incompatibility issues of EHRs caused problems in accessing and using existing data (Ford & White, 2012).

In response to this challenge, Ohio's Perinatal Quality Collaborative (OPQC) and the ODH/VS performed a study focusing on four phases of birth data registration (Ford & White, 2012).

Phase I: Completing the electronic health record

- Algorithms to flag incomplete charts
- Empowering nursing staff
- Increased teaching of hospital staff

Phase II: Process of EHR transmission by community OB

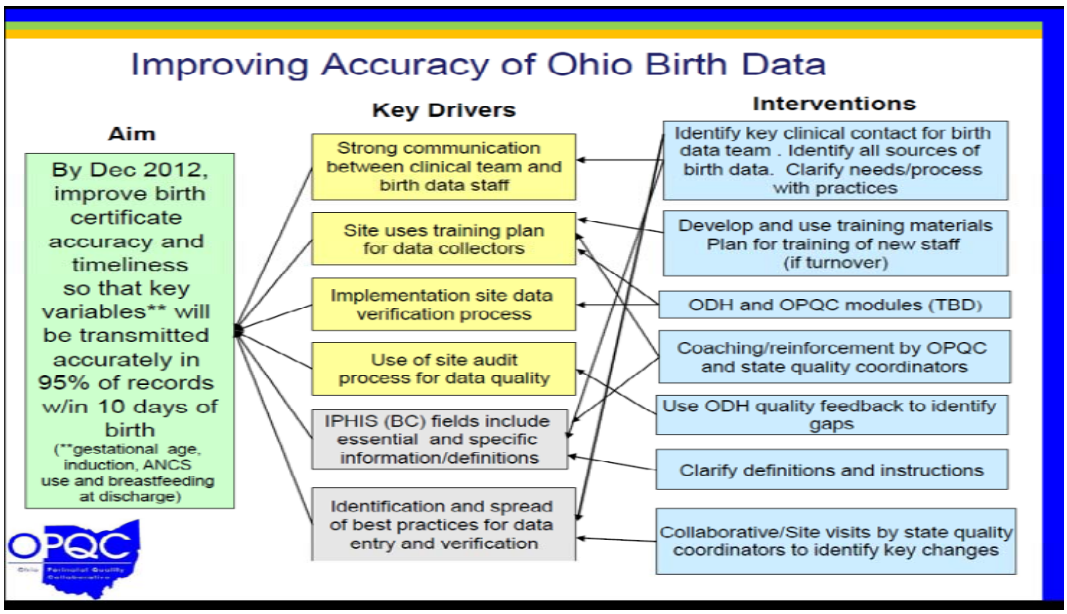
- New standardized history and physical developed
- Nurses encouraged to contact OB providers if data was missing
- Emphasized safety benefits to hospital staff peer-to-peer

Phase III: Real Time Auditing

- Nursing supervisors began real time auditing for incomplete EHR
- Pregnancy card created for each pregnant woman

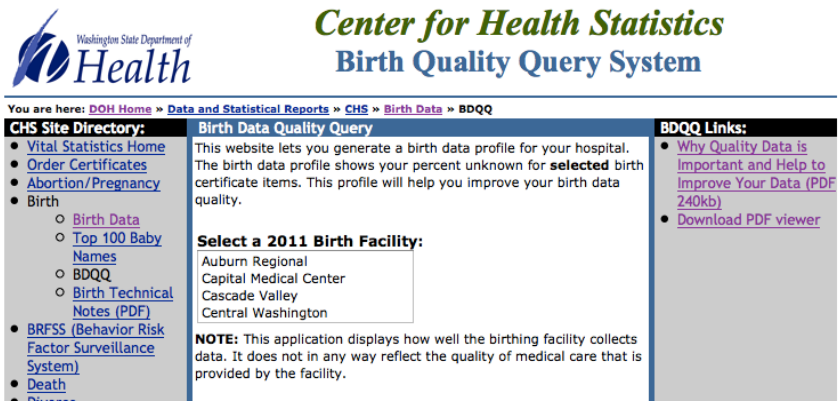
Phase IV: Real Time Auditing Continued and Expanded to High Risk Groups

The Key Driver Diagram for Improving the Accuracy of Ohio Birth Data is in the figure below and an updated version can be found online at: https://opqc.net/projects/39-weeks-dissemination-birth-registry-accuracy-project/key-driver-diagrams



B. Washington

In response to their vital statistics' needs, the State of Washington has developed a Birth Data Quality Query System (BDQQ) webpage on their State Department of Health website (https://fortress.wa.gov/doh/bdqq/(S(j3ff2t2eh0mvtcfnclsskf45))/bdqq.aspx). The BDQQ is "a tool to help you improve your birth data quality." (Washington State, 2014) It provides hospital profiles of "percent unknown" for selected items on the birth certificate. The BDQQ aims these reports at the hospitals to encourage hospitals to maintain good quality birth data. There is a PDF link on this site to their guide, which explains the format of these reports and the birth certificate in layman's terms (Washington State, 2014).



There are four possible ways to look at the data for each birth facility using the BDQQ system:

1. "Average % Unknown" compared to facilities of similar birth volume

Print Version

Hospitals of Similar Birth Volume - Average % Unknown for 2011

Birthing Facilities	Average Percent Unknown	Total Births
Swedish Ballard	0.0	887
Othello Community	0.2	601
Providence Centralia	0.3	611
Grays Harbor Community	1.7	619
Capital Medical Center	1.9	661
Naval - Bremerton	2.1	796
Saint Mary Medical Center	2.2	568
Sunnyside Community	2.8	513
Valley Spokane	3.8	629
Highline Medical Center	4.5	969
Auburn Regional	6.3	877

2. "Percent Unknown" of certain birth data items compared to the state average

Table Explanation Print Version

Auburn Regional

Percent Unknown for 2011 compared to WA State

Birth Worksheet Items	Hospital	WA State
Mother's Education	3.5	0.9
Mother's Hispanic Origin	6.6	1.5
Mother's Race	10.0	2.0
Mother's Prepregnancy Weight	1.4	4.8
Mother's Weight at Delivery	0.2	3.5
Mother's Height in Feet	0.2	2.9
Smoking in 1st Trimester	0.1	0.5
Number of Other Pregnancy Outcomes	0.3	0.8
First Prenatal Visit Month	4.3	5.7
First Prenatal Visit Day	8.4	6.6
Number of Prenatal Visits	8.8	7.7
Month Last Normal Menses	24.6	11.4
Day Last Normal Menses	29.9	12.2
Risk Factors in this Pregnancy	1.1	0.6
Obstetric Procedures	0.6	0.4
Characteristics of Labor and Delivery	1.6	0.4
Congenital Anomalies of the Newborn	5.0	0.7
Total Births	877	86,989

3. “Percent Unknown” of certain birth data items over time

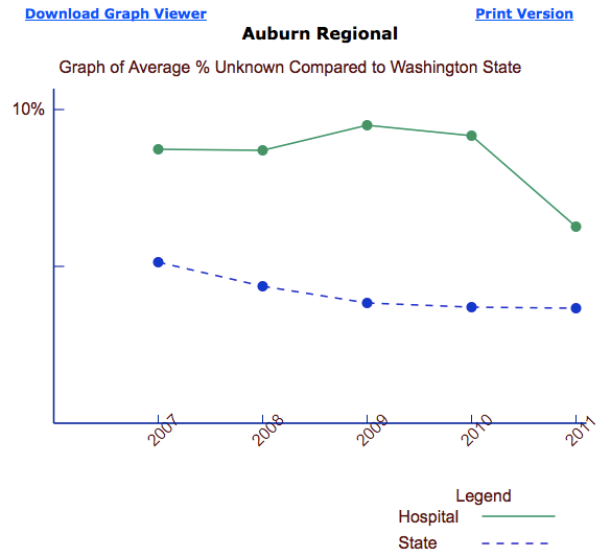
Table Explanation | Print Version

Auburn Regional

Percent Unknown Over Time

Birth Worksheet Items	2007	2008	2009	2010	2011
Mother's Education	3.9	1.7	1.2	3.6	3.5
Mother's Hispanic Origin	0.2	1.2	4.1	7.3	6.6
Mother's Race	0.2	1.0	3.6	8.4	10.0
Mother's Prepregnancy Weight	3.2	2.7	1.5	2.0	1.4
Mother's Weight at Delivery	2.3	1.9	0.7	0.2	0.2
Mother's Height in Feet	2.1	1.6	0.3	0.2	0.2
Smoking in 1st Trimester	0.0	0.4	0.0	0.0	0.1
Number of Other Pregnancy Outcomes	0.2	1.1	1.6	0.6	0.3
First Prenatal Visit Month	20.0	19.6	18.5	15.3	4.3
First Prenatal Visit Day	24.6	22.0	23.7	17.9	8.4
Number of Prenatal Visits	19.3	20.5	21.0	15.4	8.8
Month Last Normal Menses	34.5	36.1	38.5	37.6	24.6
Day Last Normal Menses	37.7	37.9	42.1	40.1	29.9
Risk Factors in this Pregnancy	0.0	0.0	0.7	0.9	1.1
Obstetric Procedures	0.0	0.0	0.7	0.7	0.6
Characteristics of Labor and Delivery	0.0	0.0	0.2	0.7	1.6
Congenital Anomalies of the Newborn	0.0	0.3	3.2	5.2	5.0
Total Births	1,077	1,094	970	940	877

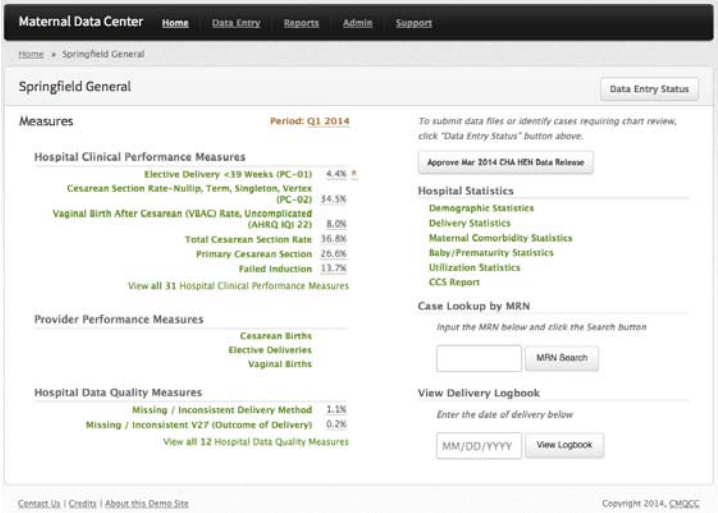
4. “Average % Unknown” compared to Washington state over time



Phyllis Reed, Epidemiology Supervisor for the Center for Health Statistics (CHS) in Washington, was interviewed. She stated the project has benefited data providers and users by giving them better feedback, and data users by giving them more complete birth data for their analyses. Improvements in data quality have been realized and this system has helped the Department of Health comply with data quality standards adopted by NCHS. The project was done within the existing CHS budget and completed by full–time employees. Development and fielding costs were about $20,651, and software licensing and training was around $3,450. The system has been well received and supported by a variety of partners and stakeholders, including state health officers, hospital administrators, and perinatal groups (Washington State, 2014).

C. California

California's Maternal Quality Care Collaborative (CMQCC) developed a California Maternal Data Center (CMDC). The CMDC is a statewide data center that collects and reports timely maternity metrics (including data quality) in a way that is "low cost, low burden, and high value for hospitals" (Main, Castles, & Murphy, 2013). The system is similar to Washington's, but with much more detail. The CMDC is overseen by a multi-stakeholder Steering Committee composed of clinicians, hospitals, payers, purchasers, consumer organizations, and relevant state agencies (Main, Castles, & Murphy, 2013). The demonstration site can be found at https://demo.datacenter.cmqcc.org/hospitals/1.



Data

Data from several sources were also analyzed for this report and are described below. These sources included Lag Analysis, Indicator Frequency, Hospitals Reporting Most Births and Deaths, and Physicians in the IDRS.

Lag Analysis

The Marion County Health Department Epidemiology Center ran a lag analysis that verified that there was a lag as long as a year in getting death certificates to the ISDH. Indiana law states that death certificates must be filed within five days; however, the state has no recourse against physicians, funeral homes, or parents not submitting death certificates. A repeat analysis was done comparing 2009 and 2011 data; the percentage of completeness improved in 2011 after the electronic reporting system was implemented. In 2009, 99% of infant death records were complete by 46 weeks; in 2011, 99% of infant death records were complete by 18 weeks.

Indicator Frequency

David Baize, former Director of ISDH Division of Vital Records, provided data analysis showing the frequencies and percentages of the quality measures the Data Committee had selected as important. The percentages of unknown data for some important variables were very small (i.e. unknown race for infant births and infant deaths was only 0.3%, unknown entry into prenatal care was 1% for low birth weight infants). However, the Indiana 2013 Revised Natality Statistical Report from NCHS showed that one hospital, with a large number of births, had listed "other" as the mother's race 35% of the time. Another

hospital indicated 98% of the infants were breastfeeding. These examples demonstrate that some hospitals were likely making large mistakes.

Hospitals Reporting the Most Births and Deaths

In 2011 and 2012, 97.5% of all births in Indiana occurred in hospitals. Residents of Indiana reported 83,750 births in 2011 (ISDH, 2012). In 2011, five facilities accounted for approximately 48% of all neonatal deaths, and one facility accounted for about 33% of post-neonatal deaths.

Indiana residents reported 83,250 births in 2012 (ISDH, 2013). In 2012, five facilities accounted for approximately 44% of all neonatal deaths, and one facility accounted for about 30% of postneonatal deaths.

Birth and Death Certificate Data Recommendations

> ***"You can design and create, and build the most wonderful place [system] in the world. But it takes people to make the dream a reality." Walt Disney***

How do we make birth certificate and death certificate data accurate, timely, and complete? We need systematic implementation with "tests of change" in the hospitals to better understand "what works," and to spread best practices. Broad suggestions are outlined below, but will not stand alone to improve data without behavior and systems changes in the birth hospitals. The suggestions below are divided into four broad categories. The workgroup then rated the suggestions in terms of feasibility and impact. The top two recommendations under each category were thought to have both impact and feasibility. Some of the recommendations, although likely to have an impact, require a higher level of resources to accomplish; as such, they were listed lower within the categories. It is also recommended that we first focus on those hospitals with the highest number of infant deaths and births, to implement and test system changes using a QI framework, and then spread best practices and experiences.

1. Provide feedback
   - Distribute a list of variables that commonly have errors to hospital administration and all staff currently involved in the reporting process
   - Notify hospital administrative and clinical leadership about the deficiencies in the vital records process
   - Design a website to publish performance reports to increase transparency
   - Increase vital records staff to be able to provide more immediate feedback

2. Provide training incentives
   - Recommend hospitals to include completion of training modules in performance reviews

- Provide regular trainings and newsletters for birth registration staff
- Develop a post test and/or a Certificate of Completion for staff completing modules
- Pursue Continuing Education Units for nurses and Continuing Medical Education credits for physicians for birth certificate training modules

3. New systems improvements
   - Add definitions of fetal death and live birth on the electronic birth and death registration systems
   - Allow staff to receive email regarding death certificates at the same time as the physician
   - Pre-load all physicians into the IDRS
   - Update IDRS or adopt new system to include definitions, instructions and clear logical data entry fields

4. Demonstrate and implement
   - Demonstrate to physicians how they should register in IDRS and how they can initiate the death record; implement a QI project to increase registration and test initiation of death record
   - Encourage hospitals to have physicians register in the IDRS during hospital orientation when they are sitting and filling out other required paperwork and learning about the hospital and other systems
   - Work with hospitals that have the highest volume of neonatal and postneonatal deaths to implement a system where staff (nurses and clerical) are authorized and trained to complete initial data entry that is then confirmed by the physician and submitted. Spread best practices through a learning community
   - Test a process with hospitals to initiate the prenatal birth record

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Appendix A: Certificate of Live Birth Work Sheet

Mother's Name_____
Mother's Medical Record #_____

CERTIFICATE OF LIVE BIRTH WORKSHEET

The information you provide below will be used to create your child's birth certificate. The birth certificate is a document that will be used for legal purposes to prove your child's age, citizenship and parentage. This document will be used by your child throughout his/her life. State laws provide protection against the unauthorized release of identifying information from the birth certificates to ensure the confidentiality of the parents and their child.

It is very important that you provide complete and accurate information to all of the questions. In addition to information used for legal purposes, other information from the birth certificate is used by health and medical researchers to study and improve the health of mothers and newborn infants. Items such as parent's education, race, and smoking will be used for studies but will not appear on copies of the birth certificate issued to you or your child.

TYPE OF BIRTH - PICK ONE:

☐ Born at Facility ☐ Born En-Route to Facility ☐ Born at Non Participating Facility
☐ Born En-Route to Non Participating Facility ☐ Home Birth ☐ Foundling

1. Facility name:* _____
(If not institution, give street and number)

2. City, Town or Location of birth: _____

3. County of birth: _____

4. Place of birth:
☐ **Hospital** ☐ **Freestanding birthing center (freestanding birthing center is one that has no direct physical connection to a hospital)**
☐ **Home birth** **Planned to deliver at home?** ☐ **Yes** ☐ **No**
☐ **Clinic/Doctor's Office** ☐ **Other (specify, e.g., taxi cab, train, plane** _____
*Facilities may wish to have pre-set responses (hard-copy and/or electronic) to questions 1-5 for births which occur at their institutions.

5. Time of birth: _____

☐ AM ☐ PM ☐ NOON ☐ MIDNIGHT

6. Date of birth: ___ ___/___ ___/___ ___ ___ ___ M M D D Y Y Y Y

7. Plurality (Specify SINGLE, TWIN, TRIPLET, QUADRUPLET, QUINTUPLET, SEXTUPLET, SEPTUPLET, or OCTUPLET for 8 or more. (Include all live births and fetal losses resulting from this pregnancy.):_____

8. If not single birth (Order delivered in the pregnancy, specify 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, etc.) (Include all live births and fetal losses resulting from this pregnancy): _____

9. If not single birth, specify number of infants in this delivery born alive:_____

10. Sex (Male, Female, or Not yet determined): _____

11. What will be your BABY'S legal name (as it should appear on the birth certificate)?

_____

First Middle Last Suffix (Jr., III, etc.)

12. MOTHER: What is your current legal name?

_____ _____ _____ _____

First Middle Last Suffix (Jr., III, etc.)

13. MOTHER: Where do you usually live--that is--where is your household/residence located?

Building number: _____ Pre-directional _____
Name of street _____
Street Designator, eg Street, Avenue, etc. _____
Post Directional _____ Apartment Number _____
State: _____(or U.S. Territory, Canadian Province)
If not United States, *Country* _____
City, Town, or Location:_____ County: _____ Zip: _____

14. Is this household inside city limits (inside the incorporated limits of the city, town or location where you live)? ☐ Yes ☐ No ☐ Don't know

15. MOTHER: What is your mailing address? ☐ Same as residence [Go to next question]

Building number: _____ Pre-directional _____
Name of street _____
Street Designator, eg Street, Avenue, etc. _____
Post Directional _____ Apartment Number _____
State: _____(or U.S. Territory, Canadian Province)
If not United States, *Country* _____
City, Town, or Location:_____ County: _____ Zip: _____

16. MOTHER: What is your date of birth? (Example: 03-04-1977)

___ ___/___ ___/___ ___ ___ ___ M M D D Y Y Y Y **AGE:** _____

17. MOTHER: In what State, U.S. territory, or foreign country were you born? Please specify one of the following:

State _____County _____ City _____
OR U.S. territory, i.e., Puerto Rico, U.S. Virgin Islands, Guam, American Samoa or Northern Marianas
_____ OR Foreign country _____

MOTHER: If you were born in the U.S. please answer the next two questions as well.
In What County were you born? _____

In What City were you born? _____
☐ **UNKNOWN**

18. MOTHER: What is your Social Security Number?

_____ _____ _____---_____ _____---_____ _____ _____ _____

19. Do you want a Social Security Number issued for your baby?

☐ **Yes (Please sign request below)** ☐ **No (Continue)**

I request that the Social Security Administration assign a Social Security number to the child named on this form and authorize the State to provide the Social Security Administration with the information from this form which is needed to assign a number. (Either parent, or the legal guardian, may sign.)

Signature of infant's mother or father_____

Date: ___ ___/___ ___/___ ___ ___ ___ M M D D Y Y Y Y

20. Will infant be placed for Adoption?

☐ **Yes** ☐ **No**

21. MOTHER: What is the highest level of schooling that you will have completed at the time of delivery? (Check the box that best describes your education. If you are currently enrolled, check the box that indicates the previous grade or highest degree received).

- ☐ 8th grade or less
- ☐ 9th - 12th grade, no diploma
- ☐ High school graduate or GED completed
- ☐ Some college credit but no degree
- ☐ Associate degree (e.g. AA, AS)
- ☐ Bachelor's degree (e.g. BA, AB, BS)
- ☐ Master's degree (e.g. MA, MS, MEng, MEd, MSW, MBA)
- ☐ Doctorate (e.g. PhD, EdD) or Professional degree (e.g. MD, DDS, DVM, LLB, JD)

22. MOTHER: What is your usual occupation or industry in which you work? Please fill in below. For example your occupation is Teacher, CPA, Waitress, Clerk, etc., and the industry in which you work is Department Store, Law Firm, Hospital, Factory, etc.

Usual Occupation: _____

Usual Industry: _____

☐ Unemployed ☐ Unknown

23. MOTHER: Are you Spanish/Hispanic/Latina? If not Spanish/Hispanic/Latina, check the "No" box. If Spanish/Hispanic/Latina, check the appropriate box.

- ☐ No, not Spanish/Hispanic/Latina
- ☐ Yes, Mexican, Mexican American, Chicana
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, other Spanish/Hispanic/Latina (e.g. Spaniard, Salvadoran, Dominican, Columbian) (specify)_____

24. MOTHER: What is your race? (Please check all that apply).

- ☐ White ☐ Black or Af rican American
- ☐ American Indian or Alaska Native (name of enrolled or principal tribe(s)) _____
- ☐ Asian Indian ☐ Chinese ☐ Filipino
- ☐ Japanese ☐ Korean ☐ Vietnamese
- ☐ Other Asian (specify)_____
- ☐ Native Hawaiian ☐ Guamanian or Chamorro ☐ Samoan
- ☐ Other Pacific Islander (specify)_____
- ☐ Other (specify) _____

MOTHER: Additional Information To Be Filled In If A PATERNITY AFFIDAVIT IS TO BE FILED FOR THIS BIRTH If Not Filing Paternity Affidavit skip to question 30.

25. What is Your Phone Number? Required _____

26. What is the name of your Employer (Company name)? Optional

_____

27. What is your Employer's address? Optional

_____

28. What is the name of your Medical Insurance Company? Optional

_____

29. What is your Medical Insurance Policy number? Optional

_____

30. MOTHER: Did you receive WIC (Women, Infants & Children) food for yourself because you were pregnant with this child?

☐ **Yes** ☐ **No** ☐ **Unknown**

31. MOTHER: What is your height? _____feet _____ inches

32. MOTHER: What was your pre-pregnancy weight, that is, your weight immediately before you became pregnant with this child? _____lbs.

33. Mother's weight at delivery _____lbs.

34. CIGARETTE SMOKING BEFORE AND DURING PREGNANCY: How many cigarettes OR packs of cigarettes did you smoke on an average day during each of the following time periods? If you NEVER smoked, enter zero for each time period.

	# of cigarettes	# of packs
Three months before pregnancy	_____	OR _____
First three months of pregnancy	_____	OR _____
Second three months of pregnancy	_____	OR _____
Last three months of pregnancy	_____	OR _____

35. CURRENT MARITAL STATUS

- ☐ Never Married
- ☐ Widowed
- ☐ Divorced
- ☐ Currently Married
- ☐ Married, but refusing Father's Information
- ☐ Unknown

36. Mother's name prior to her first marriage, (Maiden Name)

_____

First **Middle** **Last** **Suffix**

37. MOTHER'S Marital Status, ARE YOU MARRIED TO THE FATHER OF YOUR CHILD?

- ☐ Yes [Please go to question 39
- ☐ No [Please go to question 38

38. If not married, has a Paternity Affidavit been completed for this child?

☐ Yes, a paternity affidavit has been completed

If Yes Date Affidavit was signed: ____ ____/____ ____/____ ____ ____ ____

☐ No, a paternity affidavit has not been completed

If No please go to question 53

39. FATHER'S CURRENT LEGAL NAME

_____ _____ _____ _____

First Middle Last Suffix(Jr., III, etc.)

40. FATHER: What is the father's date of birth? (Example: 03-04-1977)

___ ___/___ ___/___ ___ ___ ___ M M D D Y Y Y Y **AGE:** _____

41. FATHER: In what State, U.S. territory, or foreign country was he born? Please specify one of the following:

State _____ County _____ City _____

OR U.S. territory, i.e., Puerto Rico, U.S. Virgin Islands, Guam, American Samoa or Northern Marianas

_____ OR Foreign country _____

FATHER: If the father was born in the U.S. please answer the next two questions as well.

In What County was he born? _____

In What City was he born? _____

☐ **UNKNOWN**

42. What is the father's Social Security Number? If you are not married, or if a paternity acknowledgment has not been completed, leave this item blank.

_____ _____ _____---_____ _____---_____ _____ _____ _____

43. What is the highest level of schooling that the FATHER will have completed at the time of delivery? (Check the box that best describes his education. If he is currently enrolled, check the box that indicates the previous grade or highest degree received).

☐ 8th grade or less
☐ 9th - 12th grade, no diploma
☐ High school graduate or GED completed
☐ Some college credit but no degree
☐ Associate degree (e.g. AA, AS)
☐ Bachelor's degree (e.g. BA, AB, BS)
☐ Master's degree (e.g. MA, MS, MEng, MEd, MSW, MBA)
☐ Doctorate (e.g. PhD, EdD) or Professional degree (e.g. MD, DDS, DVM, LLB, JD)

44. What is the father's usual occupation or industry. Please fill in below. For example his occupation is Photographer, Farmer, Nurse, etc., and the industry in which he works is Factory, Skating Rink, Army, etc.

Usual Occupation: _____

Usual Industry: _____

☐ Unemployed ☐ Unknown

45. Is the father Spanish/Hispanic/Latino? If not Spanish/Hispanic/Latino, check the "No" box. If Spanish/Hispanic/Latino, check all that apply.

- ☐ No, not Spanish/Hispanic/Latino
- ☐ Yes, Mexican, Mexican American, Chicano
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, other Spanish/Hispanic/Latino (e.g. Spaniard, Salvadoran, Dominican, Columbian) (specify)_____

46. What is the father's race? Please check one or more races to indicate what he considers himself to be.

- ☐ White ☐ Black or African American
- ☐ American Indian or Alaska Native (name of enrolled or principal tribe) _____
- ☐ Asian Indian ☐ Chinese ☐ Filipino
- ☐ Japanese ☐ Korean ☐ Vietnamese
- ☐ Other Asian (specify)_____
- ☐ Native Hawaiian ☐ Guamanian or Chamorro ☐ Samoan
- ☐ Other Pacific Islander (specify)_____
- ☐ Other (specify) _____

FATHER Additional Information To Be Filled In If A PATERNITY AFFIDAVIT IS TO BE FILED FOR THIS BIRTH If Not Filing Paternity Affidavit skip to question 53

47. What is Your Phone Numbert? Information is required _____

48. What is Your Current AddressNumber, Street, City, State and Zip Information is required

_____

49. What is the name of your Employer (Company name)? Information is optional

_____

50. What is your Employer's address? Information is optional

_____

51. What is the name of your Medical Insurance Company? Information is optional

_____

52. FATHER What is your Medical Insurance Policy Number Information is optional

_____

53. DID MOTHER RECEIVE PRENATAL CARE?

- ☐ **YES** ☐ **NO** ☐ **UNKNOWN**

54. Date of first prenatal care visit (prenatal care begins when a Physician or other health professional first examines and/or counsels the pregnant woman as part of an ongoing program of care for the pregnancy)___ ___ ___ ___ ___ ___ ___ ___M M D D Y Y Y Y

55. Date of last prenatal care visit (Enter the date of the last visit recorded in the mother's prenatal records)

___ ___ ___ ___ ___ ___ ___ ___ M M D D Y Y Y Y

56. Source of pre-natal care?

☐ MD ☐ DO ☐ Clinic ☐ Other, Specify: _____

57. Total number of prenatal care visits for this pregnancy (Count only those visits recorded in the record. If none enter "0"): _____

58. Date last normal menses began: ___ ___ ___ ___ ___ ___ ___ ___ M M D D Y Y Y Y

59. Number of previous live births now living (Do not include this child. For multiple deliveries, do not include the 1st born in the set if completing this worksheet for that child): Enter number or 0 for none.

_____

60. Number of previous live births now dead (Do not include this child. For multiple deliveries, do not include the 1st born in the set if completing this worksheet for that child):

Enter number or 0 for none. _____

61. Date of last live birth _____ _____/_____ _____ _____ _____ M M Y Y Y Y

62. Total number of other pregnancy outcomes (Include fetal losses of any gestational age-spontaneous losses, induced losses, and/or ectopic pregnancies. If this was a multiple delivery, include all fetal losses delivered before this infant in the pregnancy) .)

Enter number or 0 for none.: _____

63. Date of last other pregnancy outcome (Date when last pregnancy which did not result in a live birth ended):

_____ _____/_____ _____ _____ _____ M M Y Y Y Y

64. Risk factors in this pregnancy (Check all that apply):

☐ None

Diabetes - (Glucose intolerance requiring treatment)

☐ Prepregnancy - (Diagnosis prior to this pregnancy)

☐ Gestational - (Diagnosis in this pregnancy)

Hypertension - (Elevation of blood pressure above normal for age, gender, and physiological condition.)

☐ Prepregnancy - (Chronic) (Elevation of blood pressure above normal for age, gender, and physiological condition) (Diagnosed prior to the onset of this pregnancy)

☐ Gestational - (PIH, preeclampsia,) (Elevation of blood pressure above normal for age, gender, and physiological condition) (Diagnosed during this pregnancy) May include proteinuria (protein in the urine) without seizures or coma and pathologic edema (generalized swelling, including swelling of the hands, legs and face)

☐ Eclampsia (Pregnancy induced hypertension with proteinuria with generalized seizures or coma. May include pathologic edema)

☐ Previous preterm births – (History of pregnancy(ies) terminating in a live birth less than 37 completed weeks of gestation

☐ Other previous poor pregnancy outcome (Includes perinatal death, small for gestational age/intrauterine growth restricted birth) (History of pregnancies contuining into the 20th week of gestation and resulting in any of the listed outcomes. Perinatal death includes fetal and neonatal deaths)

☐ Pregnancy resulted from infertility treatment – Any assisted reproduction technique used to initiate the pregnancy. Includes fertility-enhancing drugs(e.g. Clomid, Pergonal) artifical insemination, or intrauterine insemation and assisted reproduction technology (ART) procedures(e.g. IVF, GIFT and ZIFT)

☐ Fertility enhancing drugs, artificial insemination, intrauterine insemination (Any fertility-enhancing drugs(e.g. Clomid, Pergonal) artifical insemination, or intrauterine insemation used to initate the pregnancy.

☐ Assisted reproductive technology – Any assisted reproduction technology (ART) technical procedures(e.g. in vitro fertilization (IVF), gamete intrafallopian transfer (GIFT), ZIFT) used to initate the pregnancy.

☐ Mother had a previous cesarean delivery (Previous operative delivery by extraction of the fetus, placenta and membranes through an incision in the maternal abdominal and uterine walls)

If Yes, how many____

☐ Antiretrovirals administered during pregnancy or at delivery

☐ Group B Strep

65. Infections present and/or treated during this pregnancy - (Present at start of pregnancy or confirmed diagnosis during pregnancy with or without documentation of treatment.) (Check all that apply):

☐ None
☐ Gonorrhea - (a diagnosis of or positive test for *Neisseria gonorrhoeae)*
☐ Syphilis - (also called lues - a diagnosis of or positive test for *Treponema pallidum)*
☐ Chlamydia - (a diagnosis of or positive test for *Chlamydia trachomatis*)
☐ Hepatitis B - (HBV, serum hepatitis - a diagnosis of or positive test for the hepatitis B virus)
☐ Hepatitis C - (non A, non B hepatitis, HCV - a diagnosis of or positive test for the hepatitis C virus)

66. Was a Standard Licensed Diagnostic test for HIV performed for the Mother?

☐ YES If Yes give the date the specimen was taken: _____(MMDDYYYY)

If Yes when was the test performed? ☐ During pregnancy ☐ Time of Delivery

☐ NO If No give reason (check one below)

☐ Mother's Refusal ☐ HIV Status Known ☐ Insurance would not pay

☐ Other (specify): _____

☐ Unknown (Reason why there was no test is unknown)

☐ Unknown (Unknown whether or not the test was performed.)

67. Obstetric procedures - (Medical treatment or invasive/manipulative procedure performed during this pregnancy specifically in the treatment of the pregnancy, management of labor and/or delivery.) (Check all that apply):

☐ None
☐ Cervical cerclage (Circumferential banding or structure of the cervix to prevent or treat passive dilatation. Includes MacDonald's suture, Shirodkar procedure, abdominal cerclage via laparotomy)
☐ Tocolysis – (Administration of any agent with the intent to inhibit preterm uterine contractions to extend length of pregnancy)
☐ External cephalic version – (Attempted conversion of a fetus from a non-vertex presentation by external manipulation)
☐ Successful ☐ Failed

68. Were precautions taken against ophthalmia neonatorum? ☐ **Yes** ☐ **No**

If Yes, then specify the Medication Used: _____

69. Was a Serological test for Syphilis performed for the Mother?

☐ **YES If Yes give the date the specimen was taken:_____(MMDDYYYY)**

If Yes when was the test performed? ☐ **During pregnancy** ☐ **Time of Delivery**

☐ **NO If No give reason (check one below)**

☐ **Mother's Refusal** ☐ **Syphilis Status Known**

☐ **Other (specify):**_____

☐ **Unknown (Reason why there was no test is unknown)**

Unknown (Unknown whether or not the test was performed)

70. Onset of Labor (Check all that apply):

☐ None
☐ Premature Rupture of the Membranes (prolonged >=12 hours (Spontaneous tearing of the amniotic sac, (natural breaking of the bag of waters) 12 hours or more before labor begins)
☐ Precipitous labor (<3 hours) (Labor that progresses rapidly and last less than 3 hours)
☐ Prolonged labor (>=20 hours) (Labor that progresses slowly and last for 20 hours or more

71. Characteristics of labor and delivery (Check all that apply):

☐ None
☐ Induction of labor (Initiation of uterine contractions by medical and\or surgical means for the purpose of delivery before the spontaneous onset of labor)
☐ Augmentation of labor (Stimulation of uterine contractions by drug or manipulative technique with the intent to reduce the time to delivery)
☐ Non-vertex presentation (Includes any non-vertex fetal presentation, e.g. breech, shoulder, brow, face presentations, and transverse lie in the active phase of labor or at delivery other than vertex)
☐ Steroids (glucocorticoids) for fetal lung maturation received by the mother prior to delivery (Includes betamethasone, dexamethasone, or hydrocortisone specifically given to accerlate fetal lung maturation in anticipation of preterm delivery. Excludes steroid medication given to the mother as an anti-inflammatory treatment)
☐ Antibiotics received by the mother during labor (Includes antibacterial medications given systemically (intravenous or intramuscular) to the mother in the interval between the onset of labor and the actual delivery,
☐ Clinical chorioamnionitis diagnosed during labor or maternal temperature > 38o C (100.4o F) (Clinical diagnosis of chroniamninitis during labor made by the delivery attendant. Usually includes more than one of the following; fever, uterine tenderness and/or irritability, leukocytosis and fetal tachycardia. Any maternal temperature at or above 38 C (100.4 F)
☐ Moderate/heavy meconium staining of the amniotic fluid (staining of the amniotic fluid caused by passage of fetal bowel contents during labor and\or at delivery which is more than enough to cause a greenish color change of an otherwise clear fluid)
☐ Fetal intolerance of labor was such that one or more of the following actions was taken: in-utero resuscitative measures, further fetal assessment, or operative delivery (In Utero Resucative measures such as any of the following; maternal position change, oxygen administration to the mother, intravenous fluids administered to the mother, amnioinfusion, support of maternal blood pressure and administration of uterine relaxing agents. Further fetal assessment includes any of the following; scalp pH,scalp stimulation, acoustic stimulation, Operative delivery- operative delivery intervention to shorten time to delivery of the fetus such as forceps, vacuum, or cesarean delivery)
☐ Epidural or spinal anesthesia during labor (Administration to the mother of a regional anesthic for control of the pain of labor i.e. delivery of the agent into a limited space with the distribution of the analgesic effect limited to the lower body)
☐ Abruptio Placenta

72. Method of delivery (The physical process by which the complete delivery of the infant was affected)

(Complete A, B, C, and D):

A. Was delivery with forceps attempted but unsuccessful? (Obstetric forceps was applied to the fetal head in an unsuccessful attempt at vaginal delivery) ☐ Yes ☐ No

B. Was delivery with vacuum extraction attempted but unsuccessful? (Ventouse or vacuum cup was applied to the fetal head in an unsuccessful attempt at vaginal delivery) ☐ Yes ☐ No

C. Fetal presentation at birth (Check one):
- ☐ Cephalic - (Presenting part of the fetus listed as vertex, occipital anterior (OA), occipital posterior (OP))
- ☐ Breech - (Presenting part of the fetus listed as breech, complete breech, frank breech, footling breech)
- ☐ Other - (Any other presentation not listed above)

D. Final route and method of delivery (Check one):

- ☐ Vaginal/Spontaneous (Delivery of the entire fetus through the vagina by the natural force of labor with or without manual assistance from the delivery attendant)
- ☐ Vaginal/Forceps (Delivery of the fetal head through the vagina by application of obstetrical forceps to the fetal head)
- ☐ Vaginal/Vacuum (Delivery of the fetal head through the vagina by application of a vacuum cup or ventouse to the fetal head)
- ☐ Cesarean (Extraction of the fetus, placenta and membranes through an incision in the maternal abdominal and uterine walls)

  If cesarean, was a trial of labor attempted? (Labor was allowed, augmented or induced with plans for a vaginal delivery)

  ☐ Yes ☐ No

73. Maternal morbidity (Serious complications experienced by the mother associated with labor and delivery) (Check all that apply):

☐ None

☐ Maternal transfusion (Includes infusion of whole blood or packed red blood cells associated with labor and delivery)

☐ Third or fourth degree perineal laceration (3 laceration extends completely through the perinatal skin, vaginal mucosa, perineal body and anal sphincter. 4 laceration is all of the above with extension through the rectal mucosa)

☐ Ruptured uterus - (Tearing of the uterine wall.) (

☐ Unplanned hysterectomy (Surgical removal of the uterus that was not planned prior to the admission. Includes anticipated but not definitively planned hysterectomy)

☐ Admission to intensive care unit (Any admission of the mother to a facility/unit designated as providing intensive care)

☐ Unplanned operating room procedure following delivery (Any transfer of the mother back to a surgical area for an operative procedure that was not planned prior to the admission for delivery. Excludes postpartum tubal ligations.)

74. Birthweight:

GRAMS: _____ or **POUNDS/OUNCES:** _____

75. Obstetric estimate of gestation at delivery (completed weeks):_____

(The birth attendant's final estimate of gestation based on all perinatal factors and assessments, but not the neonatal exam. Do not compute based on date of the last menstrual period and the date of birth)

76. Apgar score (A systematic measure for evaluating the infant's physical condition at specific intervals at birth)

☐ Score at **5** minutes _____ 0 through 10 ☐ Not Taken ☐ Unknown

If 5 minute score **is less than 6**:

Score at **10** minutes _____ 0 through 10 ☐ Not Taken ☐ Unknown

77. Abnormal conditions of the newborn (Disorders or significant morbidity experienced by the newborn) (Check all that apply):

☐ None

☐ Assisted ventilation required immediately following delivery (Infant given manual breaths for any duration with bag and mask or bag and endotracheal tube within the first several minutes from birth. Excludes oxygen only and laryngoscopy for aspiration of meconium)

☐ Assisted ventilation required for more than six hours (Infant given mechanical ventilation (breathing assistance) by any method for > 6 hours. Includes conventional, high frequency, and \or continuous positive pressure (CPAP)

☐ NICU admission (Admission into a facility or unit staffed and equipped to provide continuous mechanical ventilatory support for a newborn)

☐ Newborn given surfactant replacement therapy (Endotracheal instillation of a surface active suspension for the treatment of surfactant deficiency due to preterm birth or pulmonary injury resulting in respiratory distress. Includes both artificial and extracted natural surfactant)

☐ Antibiotics received by the newborn for suspected neonatal sepsis (Any antibacterial drug (e.g. pencillin, ampicillin, gentamicin, cefotoxine etc) given systemically (intravenous or intramuscular)

☐ Seizure or serious neurological dysfunction (Seizure in any involuntary repetitive, convulsive movement of behavior. Serious neurologic dysfunction is severe alteration or alertness such as obtundation, stipor or coma , i.e. hypoxic-ischemic encephalopathy. Excludes lethargy or hypotonia in the bascence of other neurologic findings. Exclude systems associated with CNS congential anomalies)

☐ Significant birth injury (skeletal fracture(s), peripheral nerve injury, and/or soft tissue/solid organ hemorrhage which requires intervention) (Defined as present immediately following delivery or manifesting soon after delivery. Includes any bony fracture or weakness or loss of sensation, but excludes fractured clavicles and transient facial neve palsy. Soft tissue hemorrhage requiring evaluation and\or treatment includes sub-galeal (progressive extravasation within the scalp) hemorrhage, giant cephalohematoma,

extensive truncal, facial and\or extremity echymosis accompanied by evidence of anemia and\or hypovolemia and\or hypotension. Solid organ hemorrhage includes subcapsular hematoma of the liver, fractures of the spleen, or adrenal hematoma)

78. Congenital anomalies of the newborn (Malformations of the newborn diagnosed prenatal or after delivery.) (Check all that apply):

☐ None of the anomalies listed

☐ Anencephaly - (Partial or complete absence of the brain and skull. Also called anencephalus, acrania, or abscent brain. Also includes infants with craniorachischisis (anencephaly with a contiguous spine defect)

- ☐ Meningomyelocele/Spina bifida (Spina Bifida is herniation of the meninges and\or spinal cord tissue through a bony defect of spine closure. Meningomyelocele is herniation of meninges and spinal cord tissue. Meningocele (herniation of meninges without spinal cord tissue) should also be included in this category. Both open and closed (covered with skin) lesions should be included. Do Not include spina bifida occulta (a midline bony spinal defect without protrusion of the spinal cord or meninges)

☐ Cyanotic congenital heart disease (Congenital heart defects which cause cyanosis. Includes but is limited to: transposition of the great arteries (vessels) tetratology of Fallott , pulmonary or pulmonic valvular atresia, tricuspid atresia, truncus arteriosus, total\partial anomalous pulmonary venous return with or without obstruction)

☐ Congenital diaphragmatic hernia (Defect in the formation of the diaphragm allowing hernation of abdominal organs into the thoracic cavity)

- ☐ Omphalocele (A defect in the anterior abdominal wall, accompanied by hernation of some abdominal organs through a widened umbilibal stalk. The defect is covered by a membrane (different from gastroschisis, see below) although this sac may rupture. Also called exomphalos. Do Not include umbilical hernia (completely covered by skin) in this category)

☐ Gastroschisis (An abnormalitiy of the anterior abdominal wall, lateral to the umbilicus, resulting in hernation of the abdominal contents directly into the amniotic cavity. Differentiated from omphalocele by the location of the defect and absence of a protective membrane)

☐ Limb reduction defect (excluding congenital amputation and dwarfing syndromes) (Complete or partial absence of a portion of an extremity associated with failure to develop)

☐ Cleft Lip with or without Cleft Palate (Incomplete closure of the lip. May be unilateral, bilateral or median)

☐ Cleft Palate alone (Incomplete fusion of the palatal shelves. May be limited to the soft palate or may extend into the hard palate. Cleft palate in the presence of the cleft lip should be included in the "cleft lip with or without Cleft Palate" category above)

☐ Down Syndrome - (Trisomy 21)

- ☐ Karyotype Confirmed
- ☐ Karyotype Pending
- ☐ Unknown

☐ Suspected chromosomal disorder (Includes any constellation of congenital malformations resulting from or compatible with known syndromes caused by detectable defects in chromosome structure)

- ☐ Karyotype Confirmed
- ☐ Karyotype Pending
- ☐ Unknown

☐ Hypospadias (Incomplete closure of the male urethra resulting in the urethral meatus opening on the ventral surface of the penis. Includes first degree- on the glans ventral to the tip, second degree- in the coronal sulcus, and thried degree- on the penile shaft)

☐ Microcephaly

79. Was infant transferred within 24 hours of delivery ? (Check "yes" if the infant was transferred from this facility to another within 24 hours of delivery. If transferred more than once, enter name of first facility to which the infant was transferred.)

☐ Yes ☐ No ☐ Unknown

If yes, name of facility infant transferred to:_____

80. Is infant living at time of report? (Infant is living at the time this birth certificate is being completed. Answer "Yes" if the infant has already been discharged to home care.)

☐ Yes ☐ No ☐ Infant transferred, status unknown

81. Is infant being breastfed at discharge?

☐ Yes ☐ No ☐ Unknown

82. Hepatitis B Immunization given?

☐ Yes ☐ No ☐ Unknown

If Yes, Date given: _____ _____/_____ _____/_____ _____ _____ _____

83. Attendant's name, title, and N.P.I

_____

Attendant's name

Attendant's title:

☐ M.D. ☐ D.O. ☐ CNM/CM - (Certified Nurse Midwife/Certified Midwife)
☐ Other Midwife - (Midwife other than CNM/CM)
☐ Other specify):_____

84. Is the Certifier the same as the Attendant

☐ Yes ☐ No ☐ Unknown

If NO answer Certifier question

85. Certifier's name and title: _____

(The individual who certifies to the fact that the birth occurred. May be, but need not be, the same as the attendant at birth.)

☐ M.D. ☐ D.O. ☐ Hospital administrator or designee
☐ CNM/CM (Certified Nurse Midwife / Certified Midwife)
☐ Other Midwife (Midwife other than CNM/CM)
☐ Other (Specify)_____

86. Date certified: __ __ __ __ __ __ __ __ M M D D Y Y Y Y

87. Principal source of payment for this delivery (At time of delivery):

☐ Private Insurance
☐ Medicaid (Comparable State program)
☐ Self-pay (No third party identified)
☐ Other (Specify, e.g., Indian Health Service, CHAMPUS/TRICARE, Other Government (federal,state, local))

_____

88. Infant's medical record number: _____

89. Newborn Screening Number: _____

If Unknown check reason why ☐ Religious Waiver

90. Was the mother transferred to this facility for maternal medical or fetal indications for delivery?

(Transfers include hospital to hospital, birth facility to hospital, etc.)

☐ Yes ☐ No

If Yes, enter the name of the facility mother transferred from:

_____