MORE BETTER FASTER

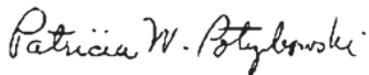*Strategies for Improving the Timeliness of Vital Statistics*

Vital statistics on important life events including births and deaths enable us to monitor prevalence of disease and overall health status, develop programs to improve public health, and evaluate the effectiveness of those interventions. Vital statistics tell us what we know about teenage pregnancy, racial and socioeconomic disparities in infant mortality, and pregnancy-related deaths. These data help us measure the impact of health insurance, access to care, and prenatal care on birth outcomes; and monitor deaths due to injury, cancer, heart disease, diabetes, and other conditions.

Indeed, these data are vital to understanding health and improving it. As such, myriad data users—health care providers, public health professionals, scientists, and policymakers—require that the data are robust, accurate, and timely to maximize their utility. A major concern expressed by data users is that vital statistics are not timely enough to meet their needs. Often these critical outcome measures are not made available for more than a year or even longer after the data year ends. The reasons for data delays are complex, and rooted in the complexities of the data collection process itself. The solutions aren't straightforward; more funding alone cannot enhance timeliness.

As Executive Director of the National Association for Public Health Statistics and Information Systems (NAPHSIS)—representing the 57 vital records jurisdictions in the United States responsible for collecting these data—I am honored to partner with the Annie E. Casey Foundation (AECF) in this effort to document challenges in vital statistics supply chain—from the time of the event, to the release of national data—and to collaborate with our partners in identifying solutions. Through this effort, we have recommended short and long-term strategies for getting more, better, faster vital statistics in the hands of our users so they are best equipped to address our nation's public health challenges.

NAPHSIS thanks AECF and our partners, both the producers and users of these data, for their support of this effort and their dedication to enhancing vital statistics. We look forward to continuing this productive collaboration as we implement this report's recommendations.

Sincerely,

Patricia W. Potrzebowski, Ph.D.
EXECUTIVE DIRECTOR, NAPHSIS

MORE BETTER FASTER *Strategies for Improving the Timeliness of Vital Statistics*

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ABBREVIATIONS

AECF	Annie E. Casey Foundation
EAB	Enumeration at Birth Program
EBRS	Electronic Birth Registration System
EDRS	Electronic Death Registration System
EHR	Electronic Health Record
IT	Information Technology
NAPHSIS	National Association for Public Health Statistics and Information Systems
NCHS	National Center for Health Statistics
SSN	Social Security Number
STEVE	State and Territorial Exchange of Vital Events
STEVE-ER	State and Territorial Exchange of Vital Events – Electronic Record
VSCP	Vital Statistics Cooperative Program
VSI	Vital Statistics Improvement
VRO	Vital Records Office

INTRODUCTION

The vital record jurisdictions—50 states, five territories, District of Columbia and New York City—are legally responsible in the United States for the registration of vital events, including births, deaths, and fetal deaths. In an example of effective federalism, the National Center for Health Statistics (NCHS) enters into contracts with the jurisdictions to obtain data on these events and compile national vital statistics through the Vital Statistics Cooperative Program (VSCP).

These data are used to monitor disease prevalence and our nation's overall health status, develop programs to improve public health, and evaluate the effectiveness of those interventions. For example, vital statistics facilitate tracking of Healthy People 2020 objectives in maternal, infant, and child health, cancer, diabetes, heart disease, respiratory disease, injury and prevention, and substance abuse, among others.

One of the major concerns expressed by data users, including health care providers, public health professionals, scientists, and policymakers is that vital statistics are not timely and are thus not useful in tracking public health trends and targeting interventions. At the national level and in many states, these critical outcome measures have not been made available for more than a year or even longer after the data year has ended. For example, national level preliminary death data (including infant deaths) for 2010 were not published until January 2012. Such a lag in vital statistics reporting is not acceptable in an era of complex health challenges—including the Great Recession and rising rates of chronic disease—and health care transformation, as the Affordable Care Act is implemented.

A major cause for delay is the nature of the vital statistics system itself. Before any national data can be finalized and released by NCHS, all 57 jurisdictions must have reported their data to NCHS. Data availability is therefore dependent upon when the last jurisdiction submits its data. In short, the national data may only be as timely as the slowest reporting jurisdiction. While the VSCP has clear, contractual timeliness requirements for data transmission, each year a handful of jurisdictions has problems providing vital records data on schedule. The reasons for these reporting problems vary from jurisdiction to jurisdiction and from year to year, and range from unexpected critical staff vacancies, to problems with new computer systems, to delayed reporting from hospitals or other data providers.

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While the need to improve the timeliness of vital statistics data is widely recognized and accepted by data users, NCHS, and the vital records jurisdictions, the reasons for enduring timeliness problems are not well understood. With support from the Annie E. Casey Foundation (AECF), the National Association for Public Health Statistics and Information Systems (NAPHSIS) in November 2012 convened a symposium to study the barriers to faster data, better understand the data user's needs, and identify strategies to help vital records jurisdictions enhance data timeliness in the short- and long-term.[1] Participants in the symposium included officials from vital records jurisdictions that varied by location, volume of data generated annually, and the timeliness of their data; officials from NCHS; and users of vital statistics, including federal officials, health care providers, and researchers (see Appendix 1).

Among the questions for discussion:

+ Why do some jurisdictions consistently provide data to NCHS on or ahead of schedule while others struggle to meet timeliness requirements? Could these strategies be successfully applied to struggling jurisdictions?

+ Why does a jurisdiction that transmits vital records on time one year not meet deadlines the next? What are the determining factors for such drastic changes and how can they be prevented?

+ Are there early warning signs that can be identified to prevent a jurisdiction from falling behind in processing and transmitting vital records data?

+ What are the root underlying causes for timeliness delays in vital records? What can be done to avoid these problems?

+ How can timeliness problems be resolved once they occur?

With a better understanding of the problems, participants identified several solutions—including some initiatives already underway—that will enhance the jurisdictions' data timeliness to better meet the user's public health needs. This report summarizes both the challenges that impede timely vital statistics, as well as recommendations and immediate next steps for "getting to success."

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1 The symposium focus is on ways in which vital records jurisdictions may enhance data timeliness, not NCHS and the data providers. NCHS is already making improvements to get national vital statistics out more quickly (e.g., preliminary and quarterly data reports). The symposium explores ways to help the jurisdictions get state-level data to NCHS and other data users more quickly.

BACKGROUND

Vital Records Legal Documents First

Vital records are permanent legal records of life events, including live births, deaths, fetal deaths, marriages, and divorces. Their history in the United States dates back to the first American settlers in the mid-1600s, and in England as early as 1538.[2] More than 8 million vital events were recorded in the United State in 2009.[3]

Many organizations and millions of Americans use these records—or certified copies of them—for myriad legal, health, personal, and other purposes.

+ Birth certificates provide proof of birth, age, parentage, birthplace, and citizenship, and are used extensively for employment purposes, school entrance, voter registration, and obtaining federal and state benefits (e.g., Social Security). Birth certificates are the cornerstone for proving identity, and as breeder documents are thus used to obtain other official identification documents, such as driver licenses, Social Security cards, and passports.

+ Death certificates provide proof of date of death, date and place of internment, cause and manner of death, and are used to obtain insurance benefits and cease direct benefit payments, transfer property, and generally settle estates.

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2 *U.S. Vital Statistics System: Major Activities and Developments, 1950 – 1995.* Centers for Disease Control and Prevention, National Center for Health Statistics. Feb 1997. Available online at: http://www.cdc.gov/nchs/data/misc/usvss.pdf

3. National Center for Health Statistics, Centers for Disease Control and Prevention. Available online at: http://www.cdc.gov/nchs/data/databriefs/db16.htm and http://www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58_25.pdf

From Records to Data

In the beginning, vital records were regarded primarily as statements of fact essential to the protection of individual rights, especially those relating to property. However, interest in vital records—and the relevant public health data they generate —widened greatly as state and federal agencies began seeking reliable data on which to define needs for and evaluate the effects of various health and welfare programs. Vital records and the data therein "assumed new importance as they were looked to as a source of credible national vital and health statistics by use of all levels of government, institutions, and the general public."[4] As health and social issues have become more complex, the content of the information collected on the vital records has significantly expanded.

The federal government does not maintain a national database that contains all of this information. Consistent with the constitutional framework set forth by our founding fathers in 1785, states were assigned certain powers. The 57 vital records jurisdictions, not the federal government, have legal authority for the registration of these records and the data, which are thus governed under state laws. The laws governing what information may be shared, with whom, and under what circumstances varies by jurisdiction.

Effective Intergovernmental Partnership

In an example of effective federalism, the vital records jurisdictions provide the federal government with data collected on birth records to facilitate secure Social Security number (SSN) issuance to newborns through the Enumeration at Birth (EAB) Program[5] and from death records to report individuals' deaths for benefit administration purposes. The oldest and most successful example of inter-governmental data sharing for public health purposes is the VSCP. It is through these cooperative agreements with the 57 vital records jurisdictions that NCHS is able to collect de-identified vital events data from the jurisdictions' vital records and compile and disseminate the nation's official vital statistics. NCHS provides the vital records jurisdictions approximately $21 million per year for preparing the vital statistics data that are used in formulating national vital statistics.

> The 57 vital records jurisdictions have legal authority for the records and data. State laws govern what information may be shared, by whom, and under what circumstances.

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4. *U.S. Vital Statistics System: Major Activities and Developments, 1950 – 1995.* Centers for Disease Control and Prevention, National Center for Health Statistics. Feb 1997. Available online at: http://www.cdc.gov/nchs/data/misc/usvss.pdf

5. The EAB program allows parents to complete applications for SSNs for their newborns as part of the hospital birth registration process. About 96 percent of SSNs for infants are assigned through the EAB process.

Incentivizing Timeliness through Vital Statistics Cooperative Program

NCHS worked in close collaboration with NAPHSIS to revise the VSCP five-year agreement, which currently runs from 2012-2016. The new agreement includes minimum standards for data submissions to enhance the performance of the vital records jurisdictions and the timeliness of the data. NCHS may withhold or reduce payment if jurisdictions fail to meet the new requirements, for example, failing to submit certain data items and not submitting data through the State and Territorial Exchange of Vital Events (STEVE) system.[6]

Recognizing some—possibly many— jurisdictions will be challenged in meeting the new timeliness and data quality requirements, NCHS also has a cooperative agreement with NAPHSIS for vital statistics improvement (VSI) that includes provisions to help jurisdictions succeed. Specifically, the VSI provides that NAPHSIS, working in collaboration with NCHS, will develop an "early warning notification system" to more proactively identify jurisdictions at risk of failing to meet new timeliness and data quality standards. Under this approach, NCHS will be responsible for running routine analyses of data received from the jurisdictions and notifying NAPHSIS of the results. Jointly, NAPHSIS and NCHS will regularly monitor timeliness and data quality statistics generated by NCHS and develop a continuous quality improvement feedback loop to jurisdictions. Under the terms of the 2012 VSCP contract, jurisdictions not meeting specific contract requirements will be required to develop and submit to NCHS an Action Plan stating how they plan to remedy identified deficiencies.

The VSI cooperative agreement also includes several other provisions to enhance the quality and timeliness of the birth, death, and fetal death data for public health surveillance and medical research. For example, NCHS and NAPHSIS will provide technical assistance, develop tutorials for data providers, and promote improvements in vital statistics data that will make these data more useful for public health surveillance and research. Specifically, a joint NAPHSIS and NCHS Data Quality Workgroup will develop a model report for hospital performance on birth reporting to be distributed to jurisdictions for hospital use.

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6. The STEVE system is an innovative messaging application developed by NAPHSIS for the electronic exchange of vital event data between jurisdictions. STEVE replaces the less secure practice of exchanging paper copies, line lists and printed computer abstracts that are used for record exchange. STEVE will also replace the Secure Data Network (SDN) as the conduit for the jurisdictions' reporting of statistical data to NCHS.

Vital Statistics Vital to Public Health

Vital statistics are used to monitor leading causes of death and our nation's overall health status, develop programs to improve public health, and evaluate the effectiveness of those interventions. Specifically, birth data have been used to:

+ Establish the relationship of smoking and adverse pregnancy outcomes, such as pre-maturity;

+ Determine caesarean delivery rates, as well as vaginal births after a caesarean delivery;

+ Monitor trends in teenage births;

+ Determine the risks of low birth weight; and

+ Measure racial disparities in pregnancy outcomes.

Just as fundamentally, death data are used to:

+ Monitor perinatal and infant mortality, which is a leading international indicator of our nation's health status compared to our counterparts overseas;

+ Track progress and regress in reducing mortality from the leading causes of death, such as heart disease, cancer, stroke, and diabetes;

+ Document racial disparities; and

+ Otherwise provide sound information for programmatic interventions.

A well-functioning registration and vital statistics system has six unique characteristics that differentiate it from surveys and other sources of data. Vital statistics are:

- ➕ Continuous, with events that happen year after year;

- ➕ Comparable, providing trends year after year;

- ➕ Complete, providing for small area data;

- ➕ Contemporaneous, providing data shortly after the event has happened, rather than retrospective surveys;

- ➕ Provides underlying and contributory causes of death and medical risk factors of pregnancy, both of which are extremely important for monitoring public health; and

- ➕ Comparatively inexpensive, since the health data are the statistical byproduct of an administrative data system.[7]

The demand for more, better, faster vital statistics will increase not only in public health, but in health care transformation, as well. Among health care providers, vital statistics provide feedback on physician and hospital performance and patient outcomes. For obstetrics, data on elective induction and caesarean section rates will have implications for Medicaid and private payer reimbursements. These data will also become increasingly relevant to hospital accreditation beginning in 2014. As one participant noted, "Pressures on [vital records jurisdictions] won't stop, because on the user side we're going to be pushed more and more to show that what we're doing works."

> **The demand for more, better, faster vital statistics will increase not only in public health, but in health care transformation, as well.**

Complex Process for Registering and Reporting Vitals

The process for registering vital events, reporting data to NCHS, and releasing vital statistics is complex, with many steps performed by many actors from start to finish (see figure). It's important to note that the process and actors may vary depending upon the event being registered (birth vs. death), but data generally flow as follows:

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7. "Vital Statistics Are Vital in Public Health: A Conversation with Sam Notzon, PhD, National Center for Health Statistics," available at http://www.cdc.gov/nchs/features/frieden_notzon_conversation.htm Feb. 8, 2013.

8. Because data providers are outside NAPHSIS' sphere of control, the symposium did not explore in-depth problems or solutions related to data providers and their impact on timeliness, howsoever their role is critical to both data timeliness and quality.

I. EVENT OCCURS

Data providers—for example, hospitals for birth information and funeral homes, physicians, and coroners for death information—submit birth and death data to the vital records jurisdictions so that the vital event can be reviewed, edited, processed and officially registered. The jurisdictions are then responsible for maintaining registries of such vital events and for issuing certified copies of birth and death records.[8]

II. VITAL RECORDS OFFICE NOTIFIED OF EVENT.[9]

1. Vital records office processes vital event data reports and accept them for registration.

2. Vital records office may undertake further quality control and follow back to data providers. For example, the vital records office would contact the hospital if important data on the pregnancy (e.g. clinical estimate of gestation), delivery (e.g. method of delivery), or infant (e.g. birth weight) is marked unknown.

III. VITAL RECORDS OFFICE PROCESSES DATA AND SUBMITS TO NCHS

3. Vital records office submits data to NCHS and addresses any NCHS quality control concerns.

4. Vital records jurisdiction where the event occurred shares record with states of residence and birth using the State-based STEVE system.

5. Vital records office conducts final year end edits, processing, and submits final data files to NCHS.

6. Vital records office addresses any final NCHS concerns and closes annual data files. NCHS compiles and publishes national vital statistics.

IV. VITAL RECORDS OFFICE MAKES DATA AVAILABLE FOR USERS

7. Vital records jurisdiction produces final database for statistical purposes.

8. Vital records jurisdiction prepares and publishes (print or online) annual statistical report, other reports.

9. Vital records jurisdiction makes its vital statistics available to users through a web-based data query system or responds to special requests for data.[10]

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9. In some jurisdictions, vital events are first registered at the local level and then reported to the state vital records office. This additional layer of reporting has implications for timelines, which we discuss in this report.

10. A list of the vital records jurisdictions' available web-based data query systems is available at http://www.naphsis.org/Pages/WebbasedDataQuerySystemsWDQS.aspx

DATA FLOW: PROCESS FOR REGISTERING AND REPORTING VITALS

The process for registering vital events, reporting data to NCHS, and releasing vital statistics is complex, with many steps performed by many actors from start to finish. When an event occurs, data providers—typically hospitals for birth information and funeral homes, physicians, and coroners for death information—submit birth and death data to the vital records jurisdictions so that the vital event can be reviewed, edited, processed and officially registered. The jurisdictions are then responsible for maintaining registries of such vital events and for issuing certified copies of birth and death records.
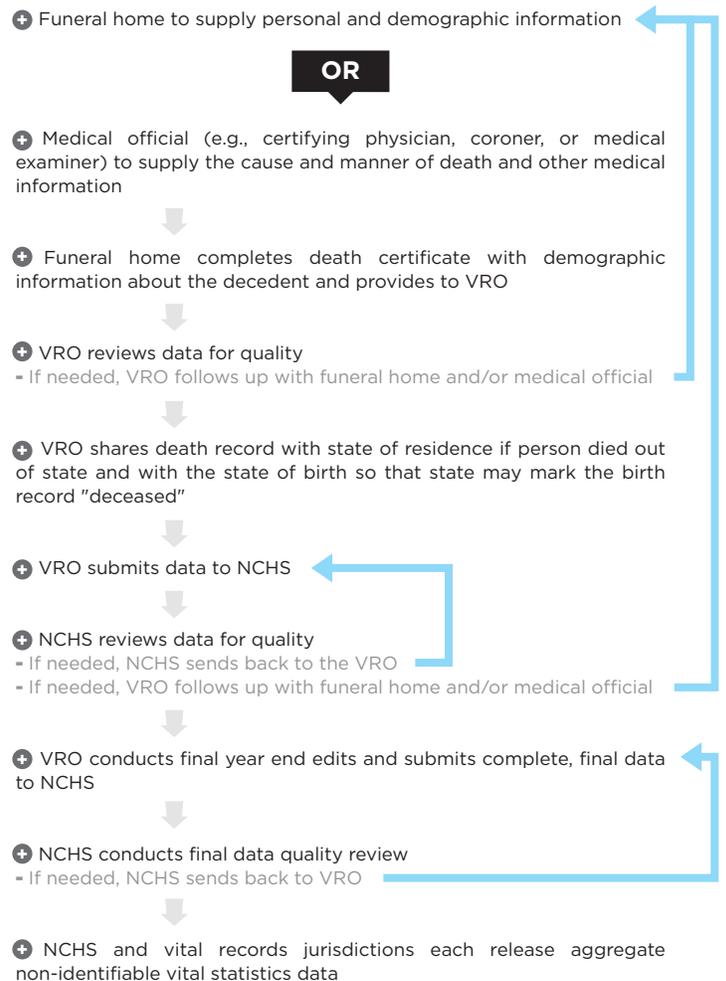
BIRTH

- Hospital reports to vital records office (VRO)

- VRO reviews data for quality
  - If needed, VRO follows up with hospital

- VRO where birth occurred shares birth record with mother's state of residence, if different

- VRO submits birth data to NCHS

- NCHS reviews data for quality
  - If needed, NCHS sends back to VRO
  - If needed, VRO follows up with hospital

- VRO conducts final year end edits and submits complete, final data to NCHS

- NCHS conducts final data quality review
  - If needed, NCHS sends back to VRO

- NCHS and vital records jurisdictions each release aggregate non-identifiable vital statistics data

There are many permutations of registering and reporting vitals; the process depends on where and how an event occurs, which determines who initiates the process. This flow chart is meant to depict the most typical scenarios for births and deaths.

DEATH

Depending upon the circumstances of the death - natural causes or questionable circumstances - the death certificate is initiated by:

- Funeral home to supply personal and demographic information

OR

- Medical official (e.g., certifying physician, coroner, or medical examiner) to supply the cause and manner of death and other medical information

- Funeral home completes death certificate with demographic information about the decedent and provides to VRO

- VRO reviews data for quality
  - If needed, VRO follows up with funeral home and/or medical official

- VRO shares death record with state of residence if person died out of state and with the state of birth so that state may mark the birth record "deceased"

- VRO submits data to NCHS

- NCHS reviews data for quality
  - If needed, NCHS sends back to the VRO
  - If needed, VRO follows up with funeral home and/or medical official

- VRO conducts final year end edits and submits complete, final data to NCHS

- NCHS conducts final data quality review
  - If needed, NCHS sends back to VRO

- NCHS and vital records jurisdictions each release aggregate non-identifiable vital statistics data

BLUE SKY: WHAT SUCCESS LOOKS LIKE

Symposium participants were asked to describe their vision of the ideal national vital statistics system. The following key characteristics emerged from the discussion:

➕ User Responsiveness

First and foremost, vital statistics must be of utility to the user community—health care providers, public health professionals, scientists, and policymakers among them—as data that are unresponsive to the needs of the community are of little use. To be responsive, the data must be of high quality, timely, and accessible. Data that are of the highest quality but three years old are not useful. Data that are released quickly but are inaccurate and unreliable are not useful. And data that are of high quality and timely are not useful if access is cost-prohibitive. Participants stressed that data do not have to be "perfect" or in "real time" to respond to the user community's needs. They stressed that often "good is good enough," but ideally a six-month lag should be the goal. They noted that the release of vital statistics data have been much improved already with NCHS efforts in recent years to release preliminary data, and with vital records jurisdictions efforts to submit data to NCHS more quickly.

➕ Modernization

A critical component of the ideal national vital statistics system is a modernized infrastructure, where all jurisdictions are collecting the same data in the same manner. Under this scenario, all jurisdictions would collect the same, richer public health information on the 2003 Standard Certificates of Birth and Death, all would do so electronically using electronic birth and death registration systems (EBRS and EDRS, respectively), and all would be using STEVE to exchange data between jurisdictions and report data to NCHS. Electronic systems are key to addressing long-standing issues related to the accuracy and timeliness of data. For example, electronic systems ensure that required fields are completed before a certificate is filed using built-in, real-time edits and crosschecks on the data entered. These automated checks then reduce edits later in the process that delay the release of the data. In addition, electronic systems eliminate the need for paper certificates to be manually completed. For death registration, where different death data providers, e.g. the funeral director and physician must complete the record, an EDRS allows them to do so concurrently from their computers. It eliminates the need for a paper death certificate to be hand-delivered by funeral home staff to the physician's office for completion. Automatic reminders and workflow prompts are built into an EDRS so a physician is notified via e-mail when a death certificate is awaiting completion. While unlikely, in an ideal vital statistics system state laws would require the use of EBRS and EDRS to register births and deaths—as was done for deaths in New York City, for example—to facilitate timelier, more accurate, and more secure data reporting.

➕ Accurate and Consistent Data

Cleaner data at the source would mitigate the need for extensive data cleanup and edits, which requires significant time and resources for the data providers, the vital records jurisdictions, and NCHS to resolve. Jurisdictions would take full advantage of an ongoing edit cycle—where NCHS regularly monitors the data for anomalies and reports to vital records jurisdictions throughout the year—by making corrections throughout the year and addressing problems at the source to avoid continued errors. All jurisdictions would have in place the Model State Vital Statistics Act or "Model Law" to standardize definitions and ensure greater consistency in reporting. The Model Law provides detailed guidance to vital records jurisdictions and state legislatures that are considering revisions of their own vital statistics laws and serves to promote uniformity among jurisdictions in definitions, registration practices, and other functions.[11] In the ideal national vital statistics system, provider payments would incentivize more timely and accurate birth data reporting. As federal payers move toward value-based purchasing, as one participant noted, "providers will use vital statistics to leverage Medicaid payment, so it's in our interest to improve the quality and timeliness of the data...that is the hook to get hospitals to pay attention."

➕ Skilled Workforce

As in any industry, the ideal national vital statistics system would have a robust, skilled workforce that is well-trained and highly vested both in the system and in the data generated. The professionals—including the data providers—would understand their role in producing high quality, timely data that are widely used to improve health. Staff would be empowered and thus more productive, easier to retain, and more willing to adapt to change. Leaders would be dynamic, accountable, change-agents who would serve as champions for vital statistics and effectively communicate the value of the system to partners and policymakers.

➕ Data Integration

A significant number of data items on birth and death certificates are captured in medical records. As an example, the facility worksheet for the revised Certificate of Live Birth and Report of Fetal Death shows 41 major categories of data collection about the birth event. Of these categories, the Worksheet suggests that 36 of these data items be collected from the medical records of the mother or child. Currently, the capturing of these items at the facility or provider level for entry into the jurisdictions' electronic systems usually occurs through manual processes. In an ideal system, medical information collected for vital records would be integrated into electronic health records (EHR) to capture vital records data at the point of contact or care.[12] Integration would eliminate or substantially reduce the need for data providers to input information manually, thereby reducing opportunities for errors that delay the release of national vital statistics. Further integration of vital records and electronic health records into payment systems would facilitate pay-for-performance and other reforms designed to enhance health care quality and improve patient outcomes.

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11. The Model Law Revision workgroup has completed its work on evaluating and revising the 1992 Model State Vital Statistics Act and Regulations. The proposed revision of the Model Law was endorsed by NAPHSIS in June 2011. The Department of Health and Human Services is currently reviewing the proposed revision of the Model Law.

12. Demographic data (e.g. name, date of birth, address) should come directly from the informant on the vital record, not from the medical record. The birth record is a legal document used for identification purposes. Therefore, it is essential that the mother (i.e., the informant) be the direct source of that legally required information, not the EHR. If the EHR provided incorrect information into the vital record and the birth record had to be amended, that amended record could create problems for the child for his or her entire life.

FACTORS THAT SLOW THE FLOW OF DATA

Data users recognize and appreciate that NCHS has made many improvements to speed the release of vital statistics and be more responsive to the user community without compromising data quality. Nevertheless, NCHS notes that they have exhausted administrative opportunities at their disposal to release the national data set more quickly. Without timelier reporting on the part of the vital records jurisdictions, users will not see further improvements. Indeed, "national vital statistics are only as fast as the slowest state."

Jurisdictions are making significant progress in modernizing the vital statistics infrastructure to enhance both data quality and timeliness. For example, all but seven jurisdictions now use electronic systems to register births, and nearly all have moved from the 1989 birth certificate to the revised 2003 Standard Certificate of Birth, which is a much more robust source of public health data. Funding has been made available to support the remaining jurisdictions that do not have fully functional EBRS; NCHS expects these jurisdictions to complete these improvements and for all jurisdictions to begin using the 2003 standard certificates by 2014.

For death registration, 37 jurisdictions are using EDRS as of March 2013. The implementation of EDRS is in progress in five vital records jurisdictions, including Virginia, Massachusetts, Mississippi, Pennsylvania, and Wisconsin. Seven jurisdictions are in the planning stages, including Alaska, Colorado, Iowa, Maryland, New York State, North Carolina, and Tennessee.[13]

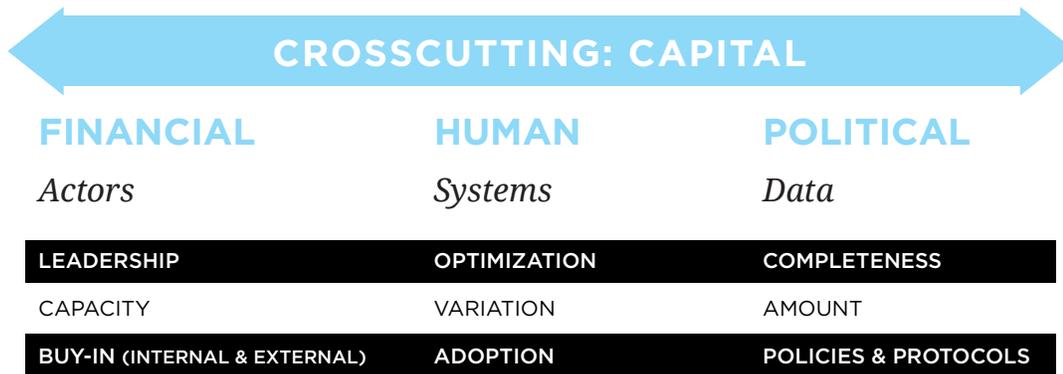## *Capital Influences All Aspects Process*

Despite this progress, barriers to faster data persist. Symposium participants discussed the main factors that impact the ability of vital records jurisdictions to get the data from providers; process the data; and share the data in a timelier manner. Capital emerged as an overarching theme that impacts data timeliness across all actors and all phases of the process (see figure).

I. FINANCIAL CAPITAL

Funding is a critical resource for enhancing the collection of vital statistics, including efforts to modernize the system. The current fiscal climate has posed significant challenges to the vital records jurisdictions. State appropriated funding for public health has eroded, and funding that was previously used to support infrastructure modernization and/or the basic operations of the vital records office—revenue derived from the sale of certified copies of certificates—has in many instances been diverted to the state general fund to underwrite other priorities.

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13. Note that the implementation of an EDRS at the vital records agency is not indicative of the total penetrance of EDRS among death data providers (e.g., funeral directors and physicians) in that jurisdiction. Progress in achieving complete electronic reporting has been stalled and is an ongoing concern in many jurisdictions. The penetrance of EDRS among data users—or lack thereof—has a significant impact on the timeliness of death data.

Figure: Contributing Factors to Data Delays

CROSSCUTTING: CAPITAL

FINANCIAL	HUMAN	POLITICAL
Actors	*Systems*	*Data*
LEADERSHIP	**OPTIMIZATION**	**COMPLETENESS**
CAPACITY	VARIATION	AMOUNT
BUY-IN (INTERNAL & EXTERNAL)	**ADOPTION**	**POLICIES & PROTOCOLS**

II. POLITICAL CAPITAL

Federal and state elected officials, as well as vital records registrars, are essential in efforts to enhance the timeliness of vital statistics. In many states, vital records operations and infrastructure improvements are a low 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, physicians) who are critical to the process, these partners do not realize the value of vital statistics and they are thus not vested in efforts to enhance data quality and timeliness. The same is true at the federal level; the expectation is that the data will always be there. Typically, unless there is a crisis of availability federal policymakers are not inclined to intervene.

III. HUMAN CAPITAL

A well-trained, empowered workforce—both within and outside the vital records office—is critical to the flow of vital statistics and the efforts to improve timeliness. Indeed, human capital can make or break the system. Staffing shortages and high turnover among data providers and vital records offices impact the timeliness of the data. The limited capacity of information technology personnel due to competing IT priorities within the state or health department delays the modernization of vital records system and roll-out of electronic systems.

These factors are not mutually exclusive. Financial capital may be a principal driving factor in the flow of data, but as our symposium participants consistently stressed, "It's not all about the money." Both human capital and political capital are just as critical for enhancing data timeliness and improving vital statistics reporting.

Three Triggers Essential to Timelier Data

Within the overarching theme of financial, human, and political capital, symposium participants identified three triggers that impact the flow of data—getting it, processing it, and sharing it. To further speed the release of vital statistics, symposium participants agreed it is essential to address challenges posed by the following three triggers: actors, systems, and the data themselves.

I. ACTORS

The vital statistics process is complex in part because of myriad actors working in concert to collect, register, and release vital statistics. The personnel at vital records jurisdictions are ultimately responsible for the data and managing the reporting process. However, they cannot do their jobs effectively if their external partners aren't effective in their jobs. Funeral directors, medical examiners, coroners, physicians, and hospital birth clerks, among others are essential to the functioning of the system. Unfortunately, their performance is largely out of the vital records jurisdictions' control. Symposium participants identified several challenges related to actors, both those within and outside the vital jurisdictions:

➕ Leadership

At this time of transformation in vital statistics, strong leaders are needed to facilitate change by generating buy-in and communicating the reason for and value of system enhancements. Not all vital records professionals currently serving in leadership positions may be ready to serve in this capacity. As one symposium participant noted, "we have re-engineered the systems, but not the people. They want to keep doing things like they've always done. We need to help them and change our people procedures." In some states, vital records officials are political appointees and may not be well-versed in the intricacies of the process and/or why it needs to evolve. Similarly, many long-time vital records registrars have retired or are approaching retirement. In some instances, the next generation of leaders may not have yet been sufficiently primed to take on a leadership role. Professional development is critical to building successful leaders.

➕ Capacity

In many jurisdictions, actors lack the capacity to respond to increasing demands for system modernization that would facilitate more timely data. For example, one large jurisdiction has lost a quarter of its staff in the past four years. In such situations, "sharing data is a lower priority than the registration of records themselves." Actors are also stretched thin as they face competing priorities. A vital records office that is implementing a new EBRS doesn't have the capacity to simultaneously implement EDRS and STEVE. Data providers face competing demands as well, as many hospitals and physicians are faced with implementing new EHR systems. High staff turnover has a significant impact on data timeliness, particularly among hospital birth clerks who provide birth data to the vital records office. New birth clerks require job training, and even with training often initially make errors in data reporting until they are more seasoned. These errors require clean up, which thus delay the reporting and release of data. With diminished capacity at the vital records offices, staff has limited availability to provide technical support to the data providers to mitigate data errors upfront. Finally, the vital records field lacks a robust pipeline for training future professionals. Educational opportunities and professional development are critical to building and sustaining capacity.

✚ Buy-In

Actors in the vital statistics system often don't see the "bigger picture" and their critical role in it. Similarly, they don't often have an opportunity to provide input into change and feel no sense of ownership over the process. The lack of buy-in among actors is a particular challenge during this time of rapid transformation, most notably, the implementation of electronic systems. Electronic systems require a substantial financial and personal commitment, and it's difficult to motivate actors to evolve if they don't see how it will benefit them and their organizations. As one symposium participant noted, "we don't have the authority to compel people to use the [electronic] systems, so they don't have input into development. It's so much easier for a funeral home director to stand there, make a physician sign a piece of paper than for the physician to log in and do it electronically." For example, in one large jurisdiction, about a third (17,000) of licensed physicians signed death certificates in 2011. Of these, only 2,560 (15 percent) signed six or more death certificates that year. When so few physicians sign off on so few death certificates annually, "they don't see value in electronic systems."

II. SYSTEMS

National vital statistics are "only as fast as the slowest state." Electronic systems are widely viewed as an essential tool in speeding the release of data. Vital records jurisdictions and data providers are all in various stages of system implementation, and the variation significantly impacts the flow of data. Specifically, jurisdictions face the following challenges:

✚ Optimization

New system implementation and continuous quality improvement of existing systems are both impediments to faster vital statistics. For jurisdictions and data providers starting from scratch, there are several factors—often beyond their immediate control—that slow the implementation of new electronic systems, including: (1) the state's IT infrastructure (e.g., in-house vs. outside vendor); (2) the procurement and development process; and (3) competing IT priorities within the vital records jurisdiction or across the state. For those early adopters with electronic systems already in place, fixing bugs and meeting new system requirements can pose challenges, depending on the flexibility of their existing electronic system. The lack of integration between EHRs and vital records also detracts from timeliness. The hospital must enter medical information needed for birth data twice, once in their own system and again in the EBRS. This duplication of effort requires additional staff time and provides greater opportunities for data-entry errors that affect quality and timeliness.

➕ Variation

Several jurisdictions are in varied stages of implementation of electronic birth, death, and fetal death registration systems. Symposium participants noted that maintaining both paper and electronic processes diminishes efficiencies and hinders the jurisdictions' ability to provide more timely data. For some jurisdictions, the laws haven't caught up with the times. For example, one participant noted that their state law requires a paper certificate be filed before officially registering a birth, even though the jurisdiction has implemented an EBRS. In this scenario, the paper-filing requirement nullifies any data timeliness that would otherwise be facilitated by the electronic system because the data cannot be reported to NCHS until the birth is officially registered.

➕ Adoption

Implementation of electronic registration systems in the vital records jurisdictions is just one piece of the puzzle. To be most effective, all data providers—funeral homes, hospitals, physician offices, nursing homes, hospices, coroners and medical examiners —also must adopt the electronic system. At present, not all data providers submit data electronically to their vital records offices even though the vital records office has an electronic system. Instead, these data providers continue to rely on manual certificate preparation. The personal delivery of records to physicians for signature, extensive and costly travel by funeral director staff to file certificates, and labor-intensive processing of paper records locally and at the state vital records offices all contribute to slowing registration and delaying the availability of death data.

III. DATA

The data themselves are key contributors to delays, with laws governing what data may be reported, how, and when in many instances proving a barrier to enhanced timeliness. Symposium participants identified several challenges associated with data:

➕ Amount of Data

Efforts to produce more and better data for public health purposes may have inadvertently slowed data timeliness. The 1989 standard birth and death certificates included more limited medical information. In response to evolving public health challenges and demand for more robust data, NCHS, NAPHSIS, and other experts collaborated in an effort to improve the data collected through birth and death certificates. The resulting 2003 Standard Certificates of Birth and Death are much more robust sources of public health data. For example, the 2003 birth certificate includes a wide range of data on access to prenatal care, pregnancy history, labor and delivery complications, delivery methods, congenital anomalies of the newborn, maternal morbidity, mother's weight and height, breast feeding status, maternal infections, smoking during pregnancy, among other factors. While beneficial for public health, the sheer volume of the data now collected slows its release. With more data, there are more opportunities for error and more data to verify and clean, which contributes to delays. In addition, not all jurisdictions are using both the 2003 birth and death certificates. Different jurisdictions reporting different data also impacts timeliness of national vital statistics data.

➕ Completeness

Data are often not reported to NCHS until they are deemed "complete" by the vital records jurisdiction. In some instances, vital records office staff determine what qualifies as "complete." As one participant noted, "our staff statistician wouldn't send anything to NCHS until it was perfect." In these instances, culture shifts may be enough to enhance timeliness. "With NCHS shifting toward 'good is good enough,' this will help us change our culture...we can then send our data to NCHS on a weekly basis and send updates later."

Nevertheless, for many jurisdictions the law complicates efforts to redefine what qualifies as "complete" and report data more quickly. For unmarried parents, the father's name cannot be added to the birth certificate until he formally acknowledges paternity. Until the vital records office receives this acknowledgment, the birth certificate may not be filed. Therefore, paternity is one of the greatest barriers to enhanced timeliness of birth data. As one symposium participant explained, "establishing paternity always holds up the birth certificate... It's a huge headache. It's our biggest issue and hugely political...When half of all births require tracking down parentage, we've blown the data's timeliness."

Within jurisdictions, the organization of the vital records function may impact completeness and hinder timeliness. State vital records offices have legal responsibility for registering and maintaining vital records and reporting data. However, in some jurisdictions the collection of records from the data providers is not centralized at the state; local vital records offices may be the data's first point of entry into the system. Without control over local registration, states have little impact on when locals provide data so they may move forward with registration. Symposium participants noted that the significant lag between local and state vital records offices is widely recognized. As one participant noted, "In [our state], having electronic systems helps, but records accumulate at the local office and they ship to the state office once a month. With 108 local offices in our state, their problems become our problems."

Finally, the complicated nature of certain types of events may impact completeness of data and its timeliness. For example, some births occur outside the hospital and the standard reporting process. As one participant noted, "in our jurisdictions home births always come in last." In addition, certain types of deaths are particularly challenging to complete, e.g., fetal and infant deaths. "It's very difficult. We spend a lot of time and energy getting the files, following up, and getting what we need to determine how an infant died." Deaths due to external causes, e.g. homicide, suicide, and unintentional injuries may take weeks and sometimes even months to complete as the results of autopsies and toxicology reports are processed.

Policies & Protocols

Inconsistent—or nonexistent—policies and protocols for collecting data may also hinder timeliness. Participants cited lack of use by data providers of the standard definitions to facilitate data reporting, especially for births. The transition from the 1989 to the 2003 Standard Certificate of Births particularly has led to errors that slow reporting. For example, one participant noted "using NCHS trend reports, we found a decline in breastfeeding in our state. We were able to narrow it down to one hospital and found that they weren't asking new moms the question." Participants also cited a lack of best practices for closing files—particularly death records—and releasing to the public. Even though each state has laws requiring the registration of death records within a specific time period, a significant number of certificates are not appropriately filed, may contain incorrect or inconsistent entries, or are not finalized until many weeks after the death occurred. In addition, incomplete death certificates and coroner cases may take weeks or even months to resolve. These late-filed and/or partially completed death certificates are not generally acceptable for use by family members, nor do they meet federal administrative needs or satisfy the information demands of local, state and federal agencies. As one participant expressed, "there are no penalties for delays, and thus no way to force data providers to comply in a timely manner."

SHORT-TERM STRATEGIES FOR GETTING TO "SUCCESS"

With a better understanding of the challenges confronting vital records jurisdictions in reporting timelier data, symposium participants discussed strategies for enhancing performance and identified "low-hanging fruit" to speed data reporting in the absence of more financial, human, and political capital. Specifically, participants were asked to consider activities within the control of the vital records jurisdictions to move the needle toward "more, better, faster" vital statistics. Representatives from jurisdictions shared from their own experiences strategies to build buy-in among data providers and their own staff, reduce data errors, and enhance strategies between the data providers, the jurisdictions, and NCHS. Based on these best practices, participants reached consensus on the following strategies:

Professional Development To Enhance Actor Performance

Symposium participants agreed that vital records jurisdictions would see the biggest returns by concentrating on the professional development of two key actors: data providers and the next generation of vital records leaders. Participants recommended:

➕ Enhancing communication about the importance of data and ways to prevent data errors

Symposium participants are using regular e-newsletters to data providers to address "common edits" and flag "issues to watch." As one participant noted, "We use our electronic newsletter as a training tool. We use it to talk about the law, changes that may be coming, and tips for correcting errors. For example, some of our biggest hospital errors were on the 'is the mother married?' field. We used our newsletter to provide tips on how to answer it, and we saw our errors go from 8,000 to 180." Another participant schedules regular, face-to-face meetings to engage data providers in the process. "We have quarterly meetings with hospitals and funeral directors to engage them. These meetings help them understand why we do what we do, and it allows us to hear from them on how we can improve. It's great to learn about their perspective. And important effort to help with data timeliness."

➕ Increasing opportunities for continuing education

Some symposium participants are using learning modules to train data providers. One jurisdiction developed a "Learning Zen" for its partners. This online training module "has dos and don'ts and how's" on filing and registration, and it also provides information on what the law requires. Our business module helps our business partners and our staff better understand filing and registration requirements in the law." Another participant suggested developing a certificate program to elevate the birth clerk profession. "NAPHSIS could work with us in creating a 'national registered birth reporting specialist'…We could train them in what the hospital EHR looks like, and NAPHSIS could train them more specifically in how to record data in your state."

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➕ Training and mentoring to cultivate new leaders

Participants agree that the aging vital records workforce necessitates succession planning. Currently some longstanding vital records leaders who retire have not sufficiently groomed their successors to lead in their absence. Strong leadership is critical during this time of transformation and constrained resources.

Evaluating System Performance and ROI

As a long-term goal, symposium participants agreed that vital records jurisdictions should continue to strive toward electronic systems, namely EBRS, EDRS, and STEVE. In the absence of resources, participants identified two ideas to address challenges with systems:

➕ Conducting a cost/benefit analysis of systems

The implementation and maintenance of electronic systems comes at great expense to the vital records jurisdictions. Conceptually, vital records jurisdictions see returns from these systems through improved efficiencies and timelier, more accurate, and more secure data. However, the true costs and benefits of electronic systems have never been evaluated. Does it make sense for all jurisdictions to invest in electronic systems for all vital events, especially low volume events such as fetal death? Is use of a more generic system, such as STEVE-ER[14] a better solution? Does it make sense for each jurisdiction to develop their own system, or could a central entity (e.g., NCHS) develop one system that jurisdictions could then use and customize? An analysis of the implementation of electronic systems to date would be helpful to jurisdictions as they prioritize where to invest their limited resources in the short and long-term. Participants agreed that, at a minimum, vital records jurisdictions should be using systems that are "efficient, sustainable, and at least pay for themselves."

➕ Identifying and using champions for marketing to data providers

In the absence of laws that mandate the use of electronic systems, vital records jurisdictions should identify data providers currently using electronic systems to champion their value to other data providers—particularly physicians responsible for reporting deaths. Featuring testimonials from current users in newsletters and other peer-to-peer publications and conferences could build "peer pressure" for providers to do the right thing. Getting user "spokespeople" to share their stories about why they went electronic and how it has helped them in their business practices might begin to move more physicians toward electronic systems.

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14. STEVE-ER (State and Territorial Exchange of Vital Events – Electronic Record) is a component of STEVE that allows a jurisdiction that cannot afford a full-fledged electronic system to enter vital records data on a web-based screen to record the vital event. The record can then be sent through STEVE to NCHS, other jurisdictions, and specified programs. STEVE-ER is available for birth, death, and fetal death. STEVE-ER is primarily used by the territories. Some states are using, or plan to use, STEVE-ER for fetal death since the number of fetal deaths recorded may not justify a large expense for a full electronic system.

Releasing Data More Quickly

With NCHS moving toward the release of preliminary and provisional data, more vital records jurisdictions may now feel free to do so, as well.[15] As a goal, vital records jurisdictions should strive to send data at least weekly to NCHS; currently 25 jurisdictions do so. NCHS will direct states to send their data weekly, where possible, so NCHS and vital records jurisdictions can work to continually clean data. "This will help with timeliness and avoid the data dump on NCHS." In addition, jurisdictions should take advantage of NCHS's ongoing edit cycle by making edits throughout the year and addressing problems at the source to avoid continued errors, rather than waiting until year end to collect. Finally, jurisdictions—especially those with a large volume of records—should follow NCHS's lead and likewise consider options for releasing their statistical data on a preliminary basis so they may be available for various uses, including public health surveillance or evaluation of programs.

Sharing Best Practices

In general, participants agreed that jurisdictions have a lot to learn from one another and their external partners, as evidenced by the timeliness symposium. Participants recommended, to the greatest extent possible, NAPHSIS should explore opportunities to facilitate opportunities to learn from each other through "learning networks." The networks could serve as incubators for developing and testing new ideas and provide an opportunity for actors in the vital statistics system to share their experiences in what works and what doesn't, test new strategies, and facilitate continuous quality improvement.

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15. Provisional counts provide the earliest estimates of vital events from NCHS. Provisional counts are based on a combination of monthly counts of events provided by each jurisdiction and a count of registered vital events processed into NCHS' electronic data files. Provisional counts do not provide any information on the characteristics of the event and there is no statistical file created from the counts. Provisional counts reports are typically released twice each year within about five months after the January – June period and about five months after the close of the calendar year. Preliminary data are based on a continuous receipt and processing of statistical records by NCHS. NCHS receives these data from the states' vital registration systems through the Vital Statistics Cooperative Program. To produce preliminary estimates, records in the file are weighted using independent counts of all births by state of occurrence. Preliminary reports are typically released within 9-12 months of the close of the data year.

OREGON: A CASE STUDY IN TIMELINESS

Best Practices for Getting More, Better, Faster Data

JOANN JACKSON, MBA
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Oregon has intentionally involved all units in our Center for Health Statistics (CHS) department to focus on timeliness in completing birth, death and fetal records, and in submitting all events to NCHS. By including all units, we have been able to develop five primary best practices that have contributed to our success.

(1) On a weekly basis, we submit all events of birth, death and fetal death records to NCHS. We also, on an ongoing basis, edit and correct records. By submitting all events weekly, we receive a weekly or bi-monthly report from NCHS for each event. Once the reports are received, we begin addressing the errors.

(2) In September of 2012, to better address the birth errors—our largest volume of errors—we began our "NCHS/CHS" project. This project was the combined brainchild of our Registration unit, Statistics unit and OVERS unit (our electronic system). Our focus for the project was to assign the responsibility of correcting errors to the hospital birth clerk who made the errors and to remove the responsibly from our staff. The project has been designed to automatically generate an individual birth-clerk error report. Every two weeks, that report is secure-emailed to the specific birth-clerk who has two-weeks to correct the errors. Most birth clerks complete the errors in just a few days. The result is fewer contacts to birth clerks, more timely corrections, and Registration staff is freed to do other work.

(3) In 2010, we improved our process for having medical certifiers and physicians complete corrections on death certificates. Two changes were made that resulted in medical certifiers and physicians responding faster to our "affidavits for correction." One change was to add a cover letter to the affidavit(s) mailed out. The letter summarizes why we query them for additional information when causes listed on death certificates are incomplete or nonspecific and/or injury information is missing. And, we ask for their assistance in improving the quality of cause of death data. The letter was created and signed by me, and is readily accessible to staff to accompany affidavits. The other change was to send the affidavit a second time four weeks later if there was no response to the first affidavit. Most medical certifiers and physicians respond to the first affidavit and others to the second one. If there is no response to the second affidavit, the staff is told to escalate the record to me, and as manager, I call the medical certifier or physician. In these few cases their responses are usually immediate.

"Oregon has intentionally involved all units in our Center for Health Statistics department to focus on timeliness... Our five best practices have greatly enhanced timeliness in Oregon and our staff feels successful!"

(4) Also in 2010, we increased the number of publications of our newsletters to our partners, which are emailed to them. Prior to 2010, newsletters were produced once a year or as time permitted. Now we publish four-times a year for birth, two-times a year for death and two-times a year for counties (our counties receive the birth and death newsletters, as well). The birth newsletter is specifically designed for birth clerks; the death newsletter is for funeral directors; and the county newsletter is for county health department staff. In addition to updates and general news, we use the newsletters as a training tool. For example, if we see a frequent error by a birth clerk on a birth record, we write an article clarifying how to correctly answer the birth record question. The newsletters reach all of Oregon's birth clerks. One frequent error was regarding the "mother married" question and its accompanying question about paternity. At its highest error rate, we had a few thousand errors in one NCHS report regarding this question. Once we explained and clarified in the newsletter how to answer the two-part question, the errors shrank to 180. And those errors were generated by new birth clerks who had not yet read how to answer the question.

(5) And finally, we have a good working relationship with our NCHS partner(s). I send the weekly files and keep NCHS informed on any issues that may delay our responses. They in turn inform me if they have issues, and we are both comfortable asking questions whenever necessary. They respond quickly to our inquiries and we respond quickly to their requests.

In summary, our five best practices have greatly enhanced timeliness in Oregon and our staff feels successful!

WHERE WE GO FROM HERE

The strategies identified in the timeliness symposium won't address all of the barriers to more timely data reporting. They will, however, move us closer to the "blue sky" and begin to address some of the user community's needs. NAPHSIS is committed to helping the vital records jurisdictions improve their processes and culture to be more responsive to data users. As an immediate first step, NAPHSIS will explore opportunities to:

- Develop a birth clerk professional development program in collaboration with relevant partners.

- Create a hub of jurisdictions' newsletters on our website so vital records offices may draw articles, ideas, and tips from the newsletters and incorporate into their own.

- Cultivate the next generation of leaders by, for example: (1) exploring funding to identify the specialized core competencies needed by vital records data managers so that training gaps can be identified and addressed; and (2) expanding opportunities for mid-career professionals to serve in NAPHSIS leadership through committees and/or Board service.

NAPHSIS will also continue to champion the vital statistics system throughout the user community, including policymakers. Vital records and statistics are fundamental, and users have the expectation the data will always be there when they need them. The vast complexities of vital statistics data collection have not previously been documented. Without a clear understanding of all that must occur to produce vital statistics, the data were often taken for granted. The data providers, producers and users must commit to building the infrastructure necessary to produce "more, better, faster data." And both producers and users must be willing to invest the necessary capital to make it happen. This symposium demonstrates the ongoing commitment of our partners—the vital records jurisdictions and the user committee—to work collaboratively to strive for "perfection."

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