SPECIFICATIONS FOR COLLECTING AND EDITING THE UNITED STATES STANDARD CERTIFICATES OF BIRTH AND DEATH -- 2003 REVISION
(Updated from 2001)

INTRODUCTION

Since the inception of a national vital statistics system, the states and the federal government have worked together cooperatively to promote standards and consistency among state vital statistics systems. The U.S. Standard Certificates of Birth and Death, and Report of Fetal Death are the principal means of promoting uniformity in the data collected by the states. These documents are reviewed and revised periodically through a process that includes broad input from data providers and users. In 1997, the National Center for Health Statistics (NCHS) appointed a panel of vital statistics data providers and users to evaluate the 1989 revisions of the certificates. The panel completed its work in April 1999 and submitted recommended revisions to NCHS.[1] Although the original intent was for all states to implement the newly revised certificates in 2003, financial and other considerations delayed the complete implementation across all states until 2016 for birth certificates, and 2018 for death certificates and fetal death reports.

NEED FOR SPECIFICATIONS

One of the primary goals of the 2003 revision of the U.S. Standard Certificates was to improve data quality. To this end, the panel working on the revisions recommended that NCHS develop and promulgate standards for vital statistics data collection and processing. This recommendation was made, in part, because the Working Group to Improve Birth Data Quality had found a decline in vital statistics birth data quality associated with electronic registration of vital events.[2] Automation has had a significant effect on the nation's vital statistics system. Although the effects of automation have been largely positive, rapidly changing technology and the piecemeal fashion in which the electronic systems used by the 57 vital records jurisdictions were developed sometimes resulted in newly-introduced data quality issues. Many of these quality issues, along with issues that appeared to be a problem for both paper and electronic systems, are documented in the Report of the Working Group to Improve the Quality of Birth Data.[2]

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[1] REPORT OF THE PANEL TO EVALUATE THE U.S. STANDARD CERTIFICATES (cdc.gov). Division of Vital Statistics, National Center for Health Statistics, April 2000 and Addenda, November 2001.

[2] REPORT OF THE WORKING GROUP TO IMPROVE THE QUALITY OF BIRTH DATA. U.S. Department of Health and Human Services, PHS, CDC, NCHS. 1998.

In an effort to minimize differences in electronic systems developed by individual vendors, ensure uniformity in national databases, and improve data quality, detailed specifications for vital records systems were prepared as part of the implementation package for the 2003 certificate revisions. When implementation of the revised U.S. Standard Certificates began in 2003, all vital statistics registration areas and software vendors were provided with detailed specifications for data collection and data submission to NCHS. The purpose of this document is to update those specifications.

The goal in providing these specifications is to offer comprehensive instructions and recommendations covering all aspects of the electronic systems. The data specifications for electronic birth, death, and fetal death registration systems include:

- Mechanisms for incorporating recommended worksheets into the system
- Item-specific edit criteria
- Computational algorithms
- Item code specifications
- Response categories, including drop down menus and "pick lists"
- Requirements for context-specific help
- Electronic transmission standards

The aim of these specifications is to have the electronic systems identify, and wherever possible, rectify data problems during or as soon after data entry as possible. To that end, we recommend that the systems edit and query at the time the data are entered, and that a second level of editing be performed for some items once the record is filed with the state office. Editing performed close to the time that data are collected should greatly reduce queries from state offices to data providers. It should also reduce queries from NCHS to the states and maximize resolution of problems before data are transmitted to NCHS, when it is often too late for them to be fixed.

States may wish to integrate Electronic Birth Registration (EBR) and Electronic Fetal Death Reporting (EFDR) systems to eliminate the need to develop and implement separate systems, and to promote more complete reporting. Electronic systems may also be integrated with other public health data systems, such as newborn screening, immunization registries, medical examiner reporting systems, or other reporting systems according to state needs. However, states should review how data are collected in other systems and the potential impact of on vital statistics information before allowing integration of systems.

The specifications include recommendations on the steps that should occur during data collection and processing, but do not specifically (with a few exceptions) mandate how the steps are to be operationalized.

The specifications are meant to be software-neutral. Any language that might be construed as mandating a particular software approach is not intentional.

NCHS will review state software for the handling of data elements to ensure that data are collected and recorded as intended. The software will also be tested to ensure that the edits and computational algorithms work as intended, and that instructions, help menus, pick lists, and drop-down menus are uniform.

The EBR and EFDR specifications were developed assuming the NCHS Standard Worksheets, available at: https://www.cdc.gov/nchs/nvss/revisions-of-the-us-standard-certificates-and-reports.htm were the source documents used to populate these systems. The standard worksheets were developed in a format that is considered the most efficient for data providers to complete; procedures may vary, however. To further encourage the use of the worksheets **the electronic systems must be designed to follow the flow of these worksheets.** These paper worksheets are also readily adaptable to electronic formats (i.e., electronic worksheets).

Many items on the Report of Fetal Death are similar or identical to those on the Birth Certificate. It is important that these electronic systems closely resemble one another so that comparable data may be collected.

GENERAL PRINCIPLES

1. Electronic birth data are to be collected in a manner and format as similar to the recommended worksheets as possible. Death data should closely follow the death certificate.

2. The specifications for electronic systems include instructions that are to appear on the screen to complete each item and instructions for help menus.

3. The specifications for electronic systems include, in many cases, the specific edit screens to be followed at data input and at later stages in the processing.

4. Once a record has been saved, and then reopened, the electronic systems should include a window for the record that lists items still pending (incomplete). The keyer should be able to go to any item in the pending list and enter data when information becomes available.

5. Default values are not permissible except for those clearly identified in the specifications.

6. Individual check boxes or item responses may not be dropped, but additional categories may be included. Any additions should be added <u>to the end of the standard list, below "None of the above."</u> For exceptions to this recommendation please contact the Director of the Division of Vital Statistics, NCHS.

7. Additional items may also be added to the certificate, but may affect responses to the standard items. Please contact the Director of DVS, NCHS before finalizing new items.

8. The certificates/worksheets generally do not include the response option "Unknown." Electronic systems, however, allow a final response of "Unknown" for a number of items.

9. Electronic non-check box numeric items such as dates, and "Unknown" will require

the entry of a character or series of characters as shown in the specifications. <u>The use of "hot keys" for unknown numeric values is recommended</u>.

10. For items where it is only correct to choose one response (e.g. Prepregnancy or gestational diabetes, or Manner of death) systems should be designed to accept only one response. Two possible ways to accomplish this are via edit messages or by blocking out other response categories after one has been selected.

11. The software must be able to integrate with external pieces of software, e.g., the state GIS system, occupation and industry coding software, and SuperMicar.

12. Although quality control tabulations are not included in the specifications (e.g., the percent of unknown responses by provider), we strongly recommend that these types of tabulations be included as an essential component of electronic systems.

13. Software and table updates should be implemented uniformly across the state.

14. Electronic systems should have the capacity to collect new data items in response to emerging issues and public health emergencies, and to send new information to NCHS.

FEATURES INTEGRAL TO THE ELECTRONIC SYSTEMS:

- **Automatic edits at time of data entry** – these are automatic messages which appear immediately after data entry for a given item. The message alerts the user of data problems (i.e., data out of range or inconsistent with other information) and allows the user to immediately modify the data. For example, after data for maternal age and maternal education are entered, cross-item edits should immediately follow. The user should <u>not</u> have discretion as to whether the edits are run. There are two types of edits - soft edits, which identify and query entries but accept the entry upon the user's approval, and hard edits, which identify and query entries that must be corrected before the record can be filed.

- **Ability to edit related items** - the user should be able to readily modify data entered for all related items when an edit has identified a problem. For example, if birthweight is found to be within the allowable range, but is inconsistent with the length of gestation, the user should be able to readily correct both items since either could be inaccurate. Similarly, since a cause of death of "Asphyxia due to drowning" is inconsistent with a manner of death of "Natural," the user should be readily able to correct either item.

- **Capture of soft-edit query** - the system should track when a soft edit has been performed. This will allow states to track frequent edit failures and take corrective action. For selected variables, when a soft edit fails a second time, a by-pass variable will be set to alert states and NCHS that the out-of-range value has been verified as correct.

- **On-screen messages** - individual item specifications include a number of reminders/instructions. A well-designed system should be able to incorporate these

messages without unduly burdening the user. Not all messages should require action on the part of the user. For example, some messages can just be flashed on the screen quickly enough to read.

- **On-line help** - Training and instructional materials that provide detailed guidance on completion of birth, death and fetal death records, as well as procedures involved in the classification, coding, and processing of data collected from vital records, are available at https://www.cdc.gov/nchs/nvss/training-and-instructional-materials.htm. "The Guide to Completing the Facility Worksheet" for the EBR is available at: https://www.cdc.gov/nchs/nvss/facility-worksheets-guide.htm?Sort=URL%3A%3Aasc. The Electronic Death Reporting System Online Reference Manual is available at https://www.cdc.gov/nchs/data/dvs/EDRS-Online-Reference-Manual.pdf. Also available are comprehensive eLearning training courses. A course on the best practices for reporting medical and health information on birth certificates and fetal death reports, developed for both clinical and nonclinical staff, is available at: https://www.cdc.gov/nchs/training/BirthCertificateElearning/. A course on improving cause of death reporting that discusses how to complete a death certificate and the importance of this information is available at NVSS - Writing Cause-of-Death Statements (cdc.gov). These courses offer continuing education credits or a certificate of completion.

- **Ability to add new items –** all systems should have the ability to add new data items quickly in response to emerging issues, and to send this information to NCHS in a standard format (see Placeholder fields).

- **Item order or flow** – EBR and EFDR systems should be designed to input data items in the same order as the worksheets, which were designed to encourage information to be gathered from the best sources.   EDR systems should be structured to input data items in the same order as they appear on the paper version of the death certificate.

- **Final review/query screen** - systems should be designed to allow the user to temporarily skip certain items to provide additional time to gather information, especially from medical records or death investigation. The final query screen should remind users to complete all missing information, and give them the opportunity to do so. All items must be completed before the record can be filed or released to the state data file. Rare responses, such as a response of "No prenatal care," or a maternal cause of death for an 11-year-old decedent, should be queried. Once a record is released to the state data file and is accepted by the state, providers should no longer have the ability to modify the record unless a correction or amendment is filed with the state or local vital records office.

- **List of pending items** - systems should allow the user to access a list of incomplete items and easily navigate to the incomplete items once a record has been worked on and saved. The user must be presented with a list of all incomplete items that must be completed before a record can be filed with the state.

- **Single-response items** - for items where it is only correct to choose one response (e.g. Principal source of payment for delivery or Manner of death) systems should be designed

to accept only one response. Two possible ways to accomplish this are via edit messages or by blocking out other response categories after one has been selected.

- **Version control** - systems should include methods to track changes in software versions and notify NCHS of version changes. Version changes considered necessary to track are those that include changes to items or edits, or more substantive changes to tables and format. Each record transmitted to NCHS should have a software version number. This notice should greatly improve NCHS's ability to identify and fix data problems.

- **Cause of death**
  - **Additional lines for cause**- Additional lines may be added as needed in the cause-of-death statement.
  - **Prohibition of pick lists**- Medical certifiers completing cause of death MUST enter medical conditions using their own terminology (e.g., pick lists or other mechanisms limiting the choice for cause are not allowed).

- **Electronic death registration system guidelines**- The National Association for Public Health Statistics and Information Systems' (NAPHSIS) Electronic Death Registration project created guidelines and associated standards (see http://www.naphsis.org) for use in developing and implementing an electronic death registration system. The NAPHSIS document deals with broad issues while the NCHS specifications document deals with individual fields.

TRANSMISSION FILE PRINCIPLES

1. State file numbers shall be sequential starting with the number 1 each year.

2. Each shipment of data shall include the state file number, date of shipment, number of records in the shipment, the software version used to collect and process the data, and all table versions used for table lookups. Each record shall indicate whether it is a new record, a record update, or a voided record.

3. Data shall be sent to NCHS as soon as possible after receipt and initial processing by the state. The state shall not wait for the results of queries before transmitting a record.

4. All record updates shall be forwarded to NCHS as soon as the updated record is accepted by the state.

FINAL REVIEW SCREEN
(Also see section on Final Review Screen)

The final review screen is designed to encourage better reporting of items for which necessary information is not immediately available (e.g., prenatal care items or toxicology results). The keyer is given the option to temporarily skip an item, that is, indicate that data to complete the item are not immediately available at the time the record is initiated. The item is then placed in pending status and, if not called up and completed beforehand, will appear on

the final review screen to be completed before the record can be transmitted to the state. On the final review screen, the keyer may enter the item information or enter a response of "Unknown."

Once a record has been saved and reopened, the keyer will also have the option to complete pending items. A list of items still pending will appear on the screen at all times after the record is re-opened, allowing the keyer to complete the items as information becomes available. For example, assume that the keyer has all information on a given birth except the mother's prenatal care data. When the keyer comes to item 6(a) "Date of first prenatal care visit," one of the first items on the facility worksheet, the keyer may indicate that the PNC record is "not yet available;" the item will be skipped, and the keyer can continue to complete other items on the record. Once the record is re-opened, the item "Date of the first prenatal visit" will appear on the pending list to be completed at the keyer's discretion. If not completed beforehand, the item will appear on the final review screen.

The "pending list" should be available to the keyer at all times after the first re-opening of the record, but the final review screen will appear only once, prior to the record being sent to the state. The final review screen is also used to query rare item responses such as a response of "no prenatal care."

BYPASS VARIABLES:

Bypass variables are sometimes used where edits are performed, and indicate the keyer has been queried about an unexpected response, and has had the opportunity to change the response. The use of bypass variables should help reduce queries from the state to data providers, and from NCHS to the states.

MISSING VALUE VARIABLE:

The "Missing Value Variable" (MVR) captures responses such as "Refused," "Sought but unknown," and "Unobtainable," which are intended to expand upon an "Unknown" response. While not necessary for most variables in the Vital Statistics System, MVRs can be useful when data are collected directly from an informant. These responses can then be reviewed by the state to identify data collection issues. The death specifications include several items for which MVR responses are recommended.

THE FINAL REVIEW SCREEN

Systems should be designed to allow the keyer to temporarily skip items for which information/records are not immediately available.

The "Final Review Screen" should appear prior to the final transmission of the record for those items still "pending." Such items include any that were marked "pending" as above, or those left blank but are required to be completed for the record to be filed with the state. It also includes items that have failed a hard edit, and selected items with relatively rare responses (e.g., "No prenatal care").

The following are instructions for the final review screen using "Date of first prenatal care visit" (item 29[a]) as an example:

When "Date of first prenatal care visit" is marked "pending" the following screen should appear:

The following item has been marked "pending." This item must be completed before the record is filed.

Complete ALL PARTS of the dates that are available. Leave blank any parts of the dates that are not known.

Month of the first visit   _____
Day of the first visit   _____
Year of the first visit   _____

     ☐   Check this button if all parts of date are unknown
     ☐   Check this button is there was no prenatal care

A response of "No prenatal care" on the <u>initial</u> entry screen, should also be verified at the final review screen. (Verification is not necessary for data entered at the state level.)

Please verify whether or not the mother received prenatal care.
     ☐   Yes, the mother received prenatal care
     ☐   No, the mother did not receive prenatal care

If "No prenatal care" is verified, there is no further query for item 29, and item 30 is skipped.

If the verification response indicates that prenatal care was provided, the following will appear:

Complete ALL PARTS of the dates that are available. Leave blank any parts of the dates that are not known.

Month of the first visit   _____
Day of the first visit   _____
Year of the first visit   _____

     ☐   Check this button if all dates are unknown
     ☐   Check this button is there was no prenatal care

Entry operator must tab through all entry fields.

If a date is entered, the edits for date are run as indicated in the item specification.

If a date is entered or the "Unknown" button checked, item 30 should be completed.

If no parts of a date are entered after tabbing through the last field, all date fields are assigned the "Unknown" codes.

TERMS AND DEFINITIONS

Soft Edit: An edit that identifies and queries entries that are outside of the expected range, but that a user may accept.

Hard Edit: An edit that identifies and queries entries outside of the expected range and requires that the entry be corrected before the record can be filed.

EBR   Electronic Birth Registration System.

EDR   Electronic Death Registration System.

EBR/EDR/ EFDR edit   Edits (both hard and soft) run before the record is transmitted to the state. Wherever feasible, edits are to be run at data entry.

State Edit   Edits performed by the state after the record has been transmitted to the state.

Help Menu Instructions   Instructions to be included as part of the standard help function.

On Screen Instructions   Instructions to complete or revise an item that should always appear on the EBC/EDC screen.

Final Review Screen   A screen designed to improve data collection by allowing the keyer additional time to gather information and by reminding the keyer to complete missing information before the record can be filed. Also queries rare responses. Instructions to complete or revise an item should always appear on the EBR/EDR/EFDR screen.

Bypass Variable   A variable that indicates the results of a query for an entry failing an edit. The results of the query are included in the transmitted data.

Missing   A variable that provides additional information for an "Unknown" value response, e.g., "Sought but unknown," "Unobtainable," and "Refused."

Processing Variables   Variables states use to collect and process vital statistics data.

Transmission Variables   Variables transmitted to NCHS as part of the VSCP contract.

For more information please contact:

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