

Electronic Death Reporting System Online Reference Manual

A Resource Guide for Jurisdictions

Version 1, December 2016

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Introduction

The importance of accurate and timely reporting from the 57 vital statistics jurisdictions of the United States is on the forefront of the nation's agenda and an important component of the overall public health surveillance agenda and national social and benefit programs. Timely knowledge of cause of death assists in the identification and response to deadly outbreaks of disease or exposures in specific geographic locations. In addition, having more recent and frequently updated information on the rates and demographic breakdown of causes of death allows more responsive health program planning and policy implementation. Progress in the collection of mortality data in this country has resulted in the availability of death record information for epidemiological studies and public health evaluations, allowing great strides in providing health care services and programs in the United States.

The Centers for Disease Control and Prevention (CDC) is supporting improvements in rapid death reporting in the United States and its territories through technical support and funding for implementation of electronic death reporting systems (EDRS). In addition to CDC, numerous organizations and agencies, including the National Association for Public Health Statistics and Information Systems (NAPHSIS), the Association of State and Territorial Health Officials (ASTHO), the National Funeral Directors Association, the National Association of Medical Examiners, and the Public Health Accreditation Board (PHAB), have bolstered this effort. Other federal agencies such as the Social Security Administration (SSA), Bureau of Labor Statistics, Department of Justice, National Institutes of Health, and Centers for Medicare & Medicaid Services have participated in improving vital statistics reporting policies and implementation. The participation of stakeholders is an important aspect of EDRS implementation. Current efforts to establish the comprehensive use of an EDRS build upon previous work in death reporting and the goal of complete and rapid reporting of mortality data from all U.S. jurisdictions.

This online manual serves as a reference for state and local agencies on implementing, updating, and maintaining an EDRS. Additionally, the manual can help jurisdictions better understand requirements and best practices set forth by CDC and the shared responsibility each holds in delivering the highest quality death records in a timely manner.

Goals and Purpose of CDC's National Center for Health Statistics

CDC's National Center for Health Statistics (NCHS) is tasked with providing "statistical information that will guide actions and policies to improve the health of the American people."¹ To have high quality data on the nation's health specifically related to vital statistics, NCHS is working with all jurisdictions to improve their death reporting to strengthen the National Vital Statistics System (NVSS) and improve jurisdictional performance for the Vital Statistics Cooperative Program (VSCP). The NVSS is a federally authorized program to share statistics on births, deaths, and fetal deaths. One goal of NVSS is to improve the timeliness and quality of the mortality data. Timeliness of death reporting is vital to ensure prompt assessment of emerging public health issues. Unfortunately, timely death reporting often has been a challenge because the majority of death reporting has been paper-based. To increase timely reporting, NCHS has offered funding to jurisdictions to improve their existing EDRS, encourage use of an EDRS, and/or upgrade or develop an EDRS. CDC's goal is to have all jurisdictions report the cause of death for at least 80% of the deaths in that jurisdiction within 10 days of the event.

Background

Mission of Electronic Death Reporting Systems

The mission of EDRS projects is to provide seamless state-of-the-art, web-based electronic registration of death records. An EDRS allows for efficient processing of death certificates and more rapid death reporting. In addition, checks and balances in the system can save time and provide more accurate data to state and national vital statistics offices.

The implementation of an EDRS offers a tremendous advantage, as it provides real-time edits and crosschecks of the data entered, which increases the quality of reporting, especially when using web-based systems. An EDRS can facilitate quick hand-offs between reporters (e.g., split reporting by medical examiners and funeral home directors) and provides automated prompts (e.g., e-mail notifications) and workflow reminders. After an EDRS is fully established in a jurisdiction, an EDRS offers the promise of relieving some of the labor required in the death reporting process.

Significance of Using an EDRS

The death report life cycle is complex (Figure 1). It includes death registration and certification and involves split reporting responsibilities and multiple stakeholders. The life cycle of reporting death data begins at the time of death and ends after the data are reported, cleaned, and placed in a final data set at NCHS. There can be multiple instances in the process where the timeliness and accuracy can be compromised. Implementing an EDRS in every jurisdiction ensures timely and accurate death certificates and, in turn, accurate mortality data that can be used in epidemiological

¹ <http://www.cdc.gov/nchs/about/mission.htm>

studies and public health evaluations used to improve health care services and programs in the United States.

Communication Strategies With EDRS Stakeholders

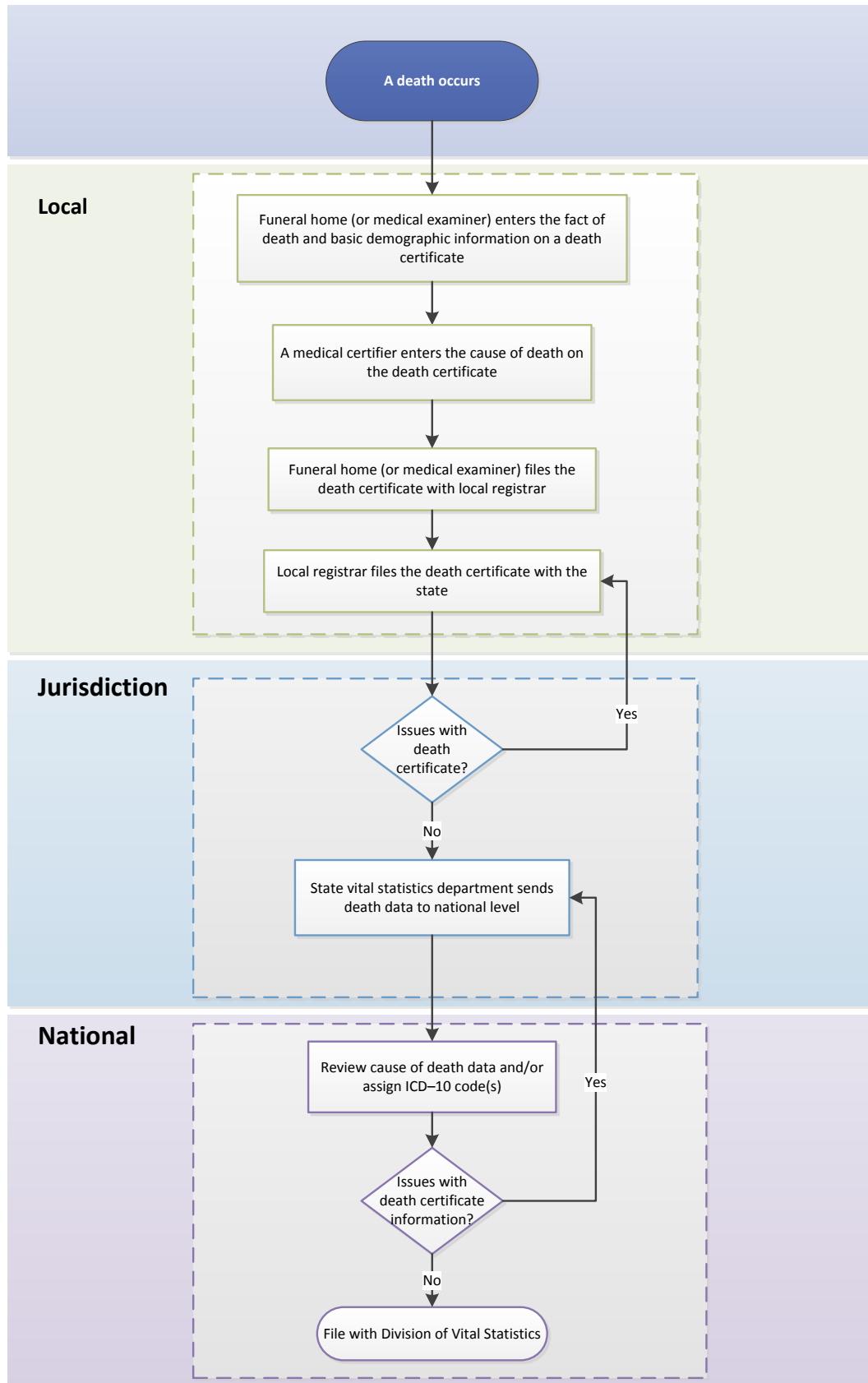
When implementing any system, the first step is to engage the stakeholders by including both users of the system and users of the resulting data. Having stakeholders on board early and throughout the development process of your jurisdiction's EDRS is key to the success of the system. The approach you take for each stakeholder may differ slightly, depending on your target audience. The following subsections highlight useful communication strategies and insights into the different stakeholders.

Communication Strategies

Some communication strategies work regardless of the stakeholder group, while others only work for a specific group. You can use these strategies for some or all of your stakeholders:

- **Include a representative of each stakeholder group on your system design team**—From the beginning, include on your design team a representative from each stakeholder group who can provide input to your system development. Have the leaders of each stakeholder group nominate someone from their group to participate in this user group. Then set up a kickoff meeting to discuss the purpose and goals of the group. Determine a regular meeting time and plan to present topics or design options at each meeting. Keep the user group informed with updates and timelines at each meeting. When the system is ready to launch, these representatives can help promote the EDRS among members of their stakeholder group. If updates or changes to the system are needed, re-engage these stakeholders for input on proposed updates or changes and to help spread the word.
- **Identify EDRS champions**—A “champion” is someone who is enthusiastic about using the system, understands the benefits of the EDRS, and encourages colleagues to use the system. Within any stakeholder group, identify champions to help promote and educate others about your EDRS; they can also be an added resource for local help desk support.

Figure 1. General Death Certificate Process



- **Attend professional meetings**—There are a number of relevant professional organizations within jurisdictions and throughout the United States that hold annual or quarterly meetings. By attending one of these meetings, you can network with different stakeholder groups in your jurisdiction and educate them about your EDRS. You can also find stakeholders who may be willing to promote the system at their own institution and become a champion of the system.
- **Send advance letters**—Alert all users of your EDRS by sending a letter and brochure via the U.S. Postal Service. This process offers a two-fold benefit: It requires your office to develop a contact list of all potential users and gets the word out to your stakeholders. You develop a list to import into your EDRS system. Additionally, requesting return mail service would allow you to know if any businesses or physicians have changed their address and if there is a new forwarding address. This method requires a budget for printing and mailing expenses. However, the return on investment can be invaluable if you are able to reach all stakeholders, especially remote businesses and offices.
- **Newsletters**—If your jurisdiction’s health department has a newsletter, take advantage of this communication to announce and promote your jurisdiction’s EDRS. When you make changes or updates to your system, use this newsletter to alert users. If your jurisdiction’s health department does not have a newsletter, it may be a good idea for the vital statistics offices to create one with a focus on the EDRS. These newsletters can be electronic and sent out monthly or quarterly via e-mail. The newsletters are a great way to keep your users informed and up to date on the latest progress with your system.
- **Advertisements**—While you are making contact with professional organizations, ask them if you can advertise your EDRS in their organization’s newsletters, magazines, and websites. Any way you can get the word out about your EDRS will help promote the system.
- **Meet with chief medical officers and hospital administrators**—Starting discussions with leaders at health care institutions are always a good idea. Meeting with the chief medical officer or director of administration at a hospital or health care institution and demonstrating the system to him or her will encourage familiarity and understanding of the EDRS. Then the chief medical officer and/or hospital administrators can promote the system to the rest of the hospital or organization.
- **Meet with head medical examiners and/or coroners**—As with the medical officers or hospital administrators, meet with and work with the lead medical examiners and coroners in your jurisdiction to talk about the EDRS. If these groups are part of the design and implementation process, they are more likely to use and endorse the EDRS in your jurisdiction. Selecting leaders who oversee local and professional associations will aid in dissemination.

- **Department of Vital Statistics websites**—To get the information out to the public, a jurisdiction can add information related to electronic reporting on their Department of Vital Statistics website. When there are legislation or statutory changes, announcements also can be made via the website.

Overall, you should use your professional network within and outside the health department to engage groups that you do not have direct relationships with to spread the word about your EDRS.



Medical Certifiers

Medical certifiers are a unique stakeholder group. Medical certifiers can include physicians, nurse practitioners, dentists, and physician assistants. They are often very busy and find it difficult to find the time to learn a new system. However, their participation is critical, as they are often the ones who provide the cause of death and sign the death certificates. If a doctor is in private practice, it may be helpful to communicate with his or her office staff. When designing your EDRS, you may want to consider a system that will allow a member of the staff to complete the death certificate that can then be reviewed and signed by the doctor.

Medical Examiners and Coroners

Medical examiners and coroners may be a challenging stakeholder group, depending on the organizational structure and role of medical examiners and coroners in your jurisdiction. However, these groups are critical to successful implementation of an EDRS, as they are responsible for investigating sudden or violent deaths and making a final judgment on the manner and cause of death. Explain how the EDRS will make their jobs easier. As with all other groups, listen to their concerns. One idea is to create a mobile website that allows medical examiners or coroners to enter information into the EDRS from the scene of an investigation on any mobile device. This mobile-accessible website would need to be compatible with all systems and browsers.

Funeral Directors

Funeral directors are important users of the EDRS. In many jurisdictions, they start the death certificate and/or help finalize it. They work directly with the public. The good news is that if you can explain the benefits of the EDRS, many funeral directors will want to use it. It can save them money and allow them to provide better customer service to their clients. The biggest challenge may be the technological requirements for EDRS implementation, since computers, software, and Internet access are needed but may not be available in all funeral homes. You may need to spend extra time with some funeral directors, but once you get them on board, they can be huge supporters of the system. They often encourage the physicians and hospitals they work with to use the system.

Local and State Registrars

Local and state registrars often process the paper death certificate locally and then send it to the state. They also provide the public with copies of paper certificates, so the new system will help them with issuing the certificates. The message to this group should be about their changing role and the importance of their new role with the public, and how they will have a new tool, which will make their work easier.

Federal, State, and Local Agencies

As with any new initiatives in the jurisdiction, you will want to garner support from and comply with policies of federal, state, and local partner agencies. Talk with them early about your plans for an EDRS. Federal agencies such as SSA and NCHS may be able to help with funding support and information on what is needed for compliance with their death certificate reporting requirements. Engagement with these federal agencies when designing the system will prevent expensive modifications later. At the state, city, or county level, seek the support of the head of the department of health and other public health programs that use vital statistics data. Communicate your plans so that he or she can look for ways to support you with stakeholders and funding. Set up meetings to keep him or her apprised of your progress. If possible, the health department head may be able to enact policy at the state level that all death information must be submitted electronically. Also, communicate with local health departments and agencies about your plans so that they can support and promote the system within their communities. Set up meetings or webcasts with these community officials to alert them to the new system prior to launch. The key is to reach out and inform appropriate federal, state, and local agencies about your EDRS.

Public Health Researchers

Public health researchers at local universities and state and federal organizations can be crucial supporters of the system. With an EDRS, high-quality vital statistics information will be available more quickly. If public health researchers have access to these data, they will be able to prepare important studies and report critical findings more rapidly. Be sure to inform them that an EDRS is being used in your jurisdiction and explain the benefits. Ask them to help champion the system at the jurisdiction level to increase funding and political support. If researchers are able to show how the death information

can lead to policy change or affect public health outcomes, jurisdiction representatives may be able to lobby for funding or legislative support of the EDRS.

Funeral Home Software Vendors

Funeral homes may use their software for the business side of their operations. Having a system that has the ability to integrate or “bridge” the two systems may be cost effective and make funeral home operations more efficient. Reaching out to this group could help with advertising the EDRS to funeral homes, especially if their software systems are compatible.

The Public

The public should be aware that your jurisdiction has an EDRS and be informed that it enables rapid reporting of public health issues, cost savings, and quicker issuance of death certificates and related benefits. Make sure the public knows where to go to report deaths and the importance of reporting quickly and accurately. Convey how this improves health and safety for the community. Public support will help secure funding for the new technology in the jurisdiction.

Benefits and Potential Value of an EDRS

An EDRS can provide a number of benefits and be of great value to each jurisdiction, although the benefits and value to each jurisdiction may differ slightly. These include potential benefits listed below.

Efficient and Timely Processing of Death Records

The goal of NCHS is to have all jurisdictions report the cause of death for at least 80% of the deaths in that jurisdiction within 10 days of the event. With an EDRS in your jurisdiction, this goal is achievable. An EDRS also makes it easier to transmit or make available to the state epidemiologist deaths related to state-specified causes of deaths within 1 day of the registration of the death or receipt of the specified cause, another NCHS goal.

Efficient and timely processing of death records is important for the following reasons:

- ❖ It provides timely information to the state epidemiologist to follow up on public health outbreaks and issues.
- ❖ It provides timely cause of death data to inform public health surveillance and intervention.
- ❖ It enables you to report deaths to SSA sooner, resulting in increased incentive payments.

Another efficiency and timing benefit of the EDRS is that technology allows for more flexibility in the registration process. A medical certifier does not need to wait for the

funeral home to be notified of a death. The medical certifier can go into the system and can start or complete a death certificate.

Data Accuracy

EDRS data tend to be more accurate than data generated manually. The reason is that the systems have built-in checks and balances. With the certifier entering the data directly, there are fewer opportunities for data entry error. When errors do occur, the medical certifier often receives an alert right after he or she enters an item that is incorrect and can then make real-time changes. At the jurisdiction level, reports can be run to check for common issues or errors. The system can then be modified to catch these errors earlier, resulting in better quality data. Additionally, with connectivity to NCHS Validation and Interactive Edits Web Service (VIEWS), the system further improves cause of death data.

Ease in Error Correction

If there is an error entered on the death certificate in the EDRS, it can be corrected quickly and easily. In the development process, the EDRS should be set up with checks in the system to flag incorrect or illogical values. The error messages should provide information for the users on why there is an error and how to correct it. This will identify the majority of issues before the data reach the jurisdiction level. At the jurisdiction level, someone can review the data to catch any additional errors. If there are errors, jurisdiction personnel can request that the medical certifier or funeral director make the change. The medical certifier or funeral director can simply log onto the EDRS, make the change, and send the correction back to the jurisdiction. In addition, NCHS can provide feedback through connectivity to VIEWS.

Immediate Access to Revisions in Death Certificate Form

An EDRS allows updates to a death certificate to be made quickly and easily. Often the cause of the death can take a few days or even months to determine. In the meantime, an interim death certificate can be created electronically so that SSA and NCHS are notified of the death. After the cause of death is ready to be entered on the form, the medical certifier can access the form online and update the appropriate fields. These data are immediately transmitted to the jurisdiction vital statistics office, and the death certificate can then be finalized. Local registrars then have immediate access to issue an updated form. There is no need to locate hard-copy forms, make manual updates, or create and track changes manually. Your system may even be set up to provide e-mail notification on outstanding causes of deaths for interim death certificates already submitted.

Expedited Access to Certified Copies

As soon as a death certificate is certified at the jurisdiction level, local registrars and health departments will have immediate access to the record, allowing them to print copies for family members. A process that used to take up to 1 week can now be done in a matter of days.

Data Exchange and Integration With Government Agencies

An EDRS makes all of the data available electronically at the jurisdiction level, allowing for easier information exchange between government agencies. During the development process, consider the requirements of other state and federal government agencies and data exchange systems such as Electronic Verification of Vital Events (EVVE) and State and Territorial Exchange of Vital Events (STEVE). The system can allow the vital statistics offices to transmit death data frequently to NCHS, other jurisdictions, and agencies.

Increased Security and Fraud Prevention

Timely reporting of deaths increases the security of the data and prevents fraud. As soon as someone is certified as deceased and SSA is notified, appropriate benefit payments can be stopped and allocated to the proper next of kin. Family members can ensure their deceased loved one's information is not being improperly used by others.

Medicaid and Medicare also can be informed more quickly and reduce the risk of fraud. All appropriate deceased members' accounts can be closed, and no one can impersonate them to receive their benefits or Social Security number.

EDRS Rollout Planning and Tracking

Types of Rollout Plans and Sample Timelines for Implementation

Having a highly functional EDRS is only part of the process. The success or failure of persuading stakeholders to use an EDRS can depend on how the EDRS is implemented and rolled out. Jurisdictions generally take one of two approaches: a statewide "blitz" or a planned phased approach. Both methods of EDRS rollout are equally effective if appropriately planned ahead of time.

When executing either plan, jurisdictions should create strategic plans and timelines for implementation and customize plans for each jurisdiction based on the size and implementation method. In general, larger jurisdictions should plan about 2–3 years for full implementation, while smaller jurisdictions should plan about 1–2 years for full implementation. The following sections provide details and example timelines for a statewide rollout plan and a regional rollout plan.

Statewide "Blitz"

Using a statewide "blitz" rollout plan means you set a date and from that date forward all death reporting must be done electronically. Usually, you notify, register, or offer training in the months preceding the launch date. When conducting a statewide rollout, the focus of your EDRS implementation efforts should be more on registration and help desk support after the launch than on training.

Most effective if:

Advantages are:

<ul style="list-style-type: none"> • there are supportive EDRS laws, • there is stakeholder support, • the jurisdiction is geographically small, • the EDRS requires minimal training, or • there is sufficient help desk support. 	<ul style="list-style-type: none"> • quick implementation process of a year or less, and • quick utilization of the system by many stakeholders.
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Help desk support is critical, and engagement of late adopters should be planned ahead of time if a statewide approach is used. Additionally, to ensure that users are not turned off by a system, have enough help desk support to assist users during the critical launch period. Table 1 is an example rollout plan for a “blitz” approach. Not included in this example is a contracting process that many jurisdictions may have to allow time for within their plans. *(Note: All tables in this section contain sample dates for demonstration purposes.)*

Table 1. Example Statewide Rollout Plan

Task	Duration	Start	End
Kickoff Meeting	1 day	10/3/2016	10/3/2016
Development of Requirements	2 months	10/4/2016	12/5/2016
Design and Configuration	2 years	12/6/2016	12/31/2018
User Acceptance Testing	2 months	1/2/2019	3/1/2019
Pilot	2 months	3/4/2019	5/6/2019
Changes From Pilot	1 month	5/6/2019	6/7/2019
Statewide Notification	4 months	2/4/2019	6/7/2019
Statewide Rollout	1 day	6/16/2019	6/16/2019
Help Desk Support	Ongoing	3/4/2019	3/1/2021
Outreach to Late Adopters	1–2 years	3/1/2019	3/1/2020 or 2021
Ongoing Trainings	1–2 years	3/1/2019	3/1/2020 or 2021

Phased Approach

A phased rollout involves the EDRS implementation staff breaking up the jurisdiction into regions or areas/facilities of interest and prioritizing the divided regions. The regions are usually geographically close together, such as neighboring counties, townships, or parishes. It is best to focus on the areas with large numbers of deaths first to ensure you are reaching the high-impact areas initially. This will maximize the amount of death data electronically received at the beginning to free up data entry staff to assist with the rollout and help desk support. This approach is often systematic, and staff time can be focused on certain parts of the jurisdiction. After

the rollout for one region of the jurisdiction is under way, then your staff can move to the next region. Rollout may take more time in some regions than in others. Taking the time to go through the jurisdiction systematically ensures the entire jurisdiction is reached and trained as thoroughly as possible. *(Note: It is not necessary to complete the rollout in one region before beginning the process in the next region.)*

Most effective if:	Advantage is:
<ul style="list-style-type: none"> • there is no legislation or regulatory requirements to implement the use of EDRS, • there is weak stakeholder support, • the jurisdiction is geographically large, or • the EDRS requires significant training. 	<ul style="list-style-type: none"> • more thorough training and engagement of stakeholders.

Similar to the statewide “blitz” approach, this approach does not mean continued outreach is not needed to have all stakeholders use the system. This approach can be implemented in 1 to 2 years, depending on the size of the jurisdiction after the development of the system. Table 2 is an example rollout plan for a phased rollout plan. Not included in this example is a contracting process that many jurisdictions may have to allow time for within their plans. *(Note: All tables in this section contain sample dates for demonstration purposes.)*

Table 2. Example Phased Rollout Plan

Region	Project Task	Duration	Start	End
Pre-rollout	Kickoff Meeting	1 day	10/3/2016	10/3/2016
Pre-rollout	Development of Requirements	2 months	10/4/2016	12/5/2016
Pre-rollout	Design and Configuration	2 years	12/6/2016	12/31/2018
Pre-rollout	User Acceptance Testing	2 months	1/2/2019	3/1/2019
Pre-rollout	Pilot	2 months	3/4/2019	5/6/2019
Pre-rollout	Prepare Regional Launch and Training Materials	2.5 months	5/6/2019	7/12/2019
1	Advance Notification/Registration Requests	4 weeks	7/15/2019	8/9/2019
1	Training	4 weeks	8/12/2019	9/6/2019
1	Go Live	2 days	9/9/2019	9/11/2019
2	Advance Notification/Registration Requests	4 weeks	9/16/2019	10/11/2019
2	Training	4 weeks	10/14/2019	11/8/2019
2	Go Live	2 days	11/12/2019	11/14/2019
3	Advance Notification/Registration Requests	4 weeks	11/18/2019	12/13/2019
3	Training	4 weeks	12/16/2019	1/10/2020
3	Go Live	2 days	1/13/2020	1/15/2020

Table 2. Example Phased Rollout Plan (continued)

Region	Project Task	Duration	Start	End
4	Advance Notification/Registration Requests	4 weeks	1/20/2020	2/14/2020
4	Training	4 weeks	2/17/2020	3/13/2020
4	Go Live	2 days	3/16/2020	3/18/2020
5	Advance Notification/Registration Requests	4 weeks	4/23/2020	4/17/2020
5	Training	4 weeks	4/20/2020	5/15/2020
5	Go Live	2 days	5/18/2020	5/20/2020
All Regions	Help Desk Support	2 years	2/4/2019	2/4/2021
All Regions	Outreach Late Adopters	2 years	5/26/2020	5/26/2022
All Regions	Ongoing Trainings	2 years	6/1/2020	6/1/2022

Summary of Planning

Decide which approach is best for your jurisdiction and create a strategic plan and timeline. The plan should be adjusted as needed after implementation has started. If you start out with a statewide “blitz” plan and find the stakeholders are not responsive or you do not have the staff to support such a plan, consider your efforts as a pilot phase. Regroup with your EDRS implementation team and revise the plan and timeline, perhaps shifting to a phased approach.

Tips for successful rollout plans include the following:

- ❖ Have a “champion” of the system among each stakeholder group.
- ❖ Contact a jurisdiction that has had EDRS for a few years and is similar in geographic and/or population size for suggestions on implementing an EDRS. Learn about both the successful procedures and those that were unsuccessful.

Taking the time to strategically plan the rollout is a critical factor to success. The plan should aim to recruit and get on board the geographic areas, hospitals, and doctors who report the most deaths first. If these geographic areas, hospitals, and doctors use the system and report deaths electronically, jurisdiction staff who were previously involved with paper death certificate handling, data entry, and quality control are freed up for other work.

Tracking Rollout

The success of convincing stakeholders to use the EDRS depends a great deal on the ease with which the system is rolled out. A well thought-out rollout plan is critical to a seamless transition from paper-based to electronic reporting. After your plan is set, create measurements to track your success. For example if you are planning a statewide blitz, you may want to track usage by user type across the whole state. If you have a regional implementation plan, you would want to track usage by user type in each region and across the entire state. Tables 3 and 4 are examples of such tracking tables. *(Note: All tables in this section contain sample data for demonstration purposes.)*

Table 3. Example Statewide Blitz Tracking

Users	Percent Paper	Percent EDRS	Total
Physicians/Certified Nurse Practitioner	15	85	100
Medical Examiners/Coroners	25	75	100
Funeral Directors	2	98	100
Registrars	2	98	100

Table 4. Example Regional Rollout Tracking

Regions	Users	Percent Paper	Percent EDRS	Total
Region 1	Medical Certifiers	0	100	100
	Medical Examiners/Coroners	0	100	100
	Funeral Directors	0	100	100
	Registrars	0	100	100
Region 2	Medical Certifiers	25	75	100
	Medical Examiners/Coroners	15	85	100
	Funeral Directors	0	100	100
	Registrars	0	100	100
Region 3	Medical Certifiers	33	67	100
	Medical Examiners/Coroners	10	90	100
	Funeral Directors	56	44	100
	Registrars	25	75	100

Information on Training Materials

The best type of training is in-person small group training. In-person small group training is most effective because it allows for more one-on-one training, users feel more comfortable asking questions, and trainers can spend more time on topics that are difficult. Moreover, users trained in small group sessions often retain what they have learned and do not need retraining. Live demonstration of the system is ideal for understanding how to use your EDRS. If in-person training is not feasible, the next best option is the train-the-trainer method. Train-the-trainer means that you train one person at a facility or in an area, and he or she then trains other users at their facility or in their area. This approach may work best at large institutions, such as hospitals, where many users may be entering EDRS information. Other training options that have worked for some jurisdictions include webinars and web-based videos that demonstrate the system or parts of the system, user guides, and Frequently Asked Questions documents. Below are links to training programs other states have created to train users on their EDRS.

- ❖ Louisiana's training videos: <http://dhh.louisiana.gov/index.cfm/page/1263>
- ❖ Maine's online training materials: <http://www.maine.gov/dhhs/mecdc/public-health-systems/data-research/vital-records/edrs/training-materials.html>
- ❖ Oregon online training materials: <http://public.health.oregon.gov/BirthDeathCertificates/RegisterVitalRecords/overs/Pages/index.aspx>
- ❖ Massachusetts cause of death training: <http://www.massmed.org/cme/causeofdeath/>

If you have an EDRS up and running in your jurisdiction or are starting to implement one, how do you measure your success? You can track a number of measurements to determine if your training and implementation strategies and electronic data collection efforts are working well and producing quality data.

Tracking Training

As with overall implementation tracking, you will want to track your training efforts. Again, the easiest way to track is by user type, as different users might receive slightly different trainings, depending upon their roles in your EDRS. Table 5 provides an example of tracking your training efforts. You could have separate tables for each user type. In addition to providing information about the number of stakeholders trained, the table may also contain information that can be used to improve your training sessions. For example, if there is a large discrepancy between the number of people who sign up for training and those who are actually trained, perhaps the training is being held at an inconvenient time or is too long.

Table 5. Example Tracking Training

Medical Certifiers					
Training Week	Contact Information Was Insufficient	Scheduled but Did Not Attend Training	Trained	No Longer in the Jurisdiction	Contacted
Week 1	3	1	40	2	46
Week 2	2	0	63	0	65
Week 3	10	2	19	1	32
Total	15	3	122	3	143

Tracking Electronic Submission of Data

A key measure of the success of your training and implementation process will be the number of users who submit their death data electronically. Another good way to evaluate your EDRS is to track your electronic data submissions to NCHS against its goals, listed as follows:

- ❖ Receive at least 80% of a jurisdiction’s mortality records electronically through its EDRS.
- ❖ Receive death information collected through EDRS within 10 days of the date of the event for at least 80% of death events occurring within each jurisdiction.
- ❖ Transmit or make available the death data related to state-specified causes of deaths to the state epidemiologist within 1 day of the registration of the death or receipt of the specified cause.

Tables 6 and 7 are examples of how to track electronic data submission in your jurisdiction.

Table 6. Example User Electronic Filing Status

User Type	Actual Electronic Filing	Goal for Electronic Filing	Paper Filing
Physicians/Certified Nurse Practitioner	65%	100%	35%
Medical Examiners/Corners	85%	100%	15%
Funeral Directors	98%	100%	2%
Registrars	98%	100%	2%

Table 7. Example NCHS Goal Tracking

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	YTD Totals
Number of deaths (estimated or actual)	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	96,000
Fully electronic records received via EDRS - planned	1,860	2,445	3,275	4,250	5,500	6,749	7,500	7,500	7,500	7,500	7,500	7,500	69,079
Fully electronic records received via EDRS - actual	800	1,800	3,000	4,000	5,000	6,000	6,500	6,500	7,000	7,000	7,500	7,500	62,600
Percent received via EDRS - actual	10.0%	22.5%	37.5%	50.0%	62.5%	75.0%	81.3%	81.3%	87.5%	87.5%	93.8%	93.8%	65.2%
Number sent to NCHS with cause of death within 10 days	200	800	1,000	1,500	2,000	2,500	3,500	4,500	5,500	6,000	6,600	7,100	41,200
Percent sent to NCHS with cause of death within 10 days	2.5%	10.0%	12.5%	18.8%	25.0%	31.3%	43.8%	56.3%	68.8%	75.0%	82.5%	88.8%	42.9%
Number of deaths due to specific causes tracked by the state epidemiologist	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	18,000
Number sent to the state epidemiologist within 1 day of cause of death certification	300	400	500	600	800	1,000	1,200	1,400	1,400	1,400	1,400	1,400	11,800
Percent sent to the state epidemiologist within 1 day of cause of death certification	20.0%	26.7%	33.3%	40.0%	53.3%	66.7%	80.0%	93.3%	93.3%	93.3%	93.3%	93.3%	65.6%
2016 records sent to NCHS this month (all types)	2,000	4,000	6,000	7,000	8,000	9,000	9,500	9,500	9,500	9,500	9,500	9,500	9,500
Total 2016 records sent to NCHS to date (all types)	2,000	6,000	12,000	19,000	27,000	36,000	45,500	55,000	64,500	74,000	83,500	93,000	93,000
Percent of expected records sent to NCHS to date	2.1%	6.3%	12.5%	19.8%	28.1%	37.5%	47.4%	57.3%	67.2%	77.1%	87.0%	96.9%	96.9%

Quality Assurance Measures

Quality assurance measures should be built into your EDRS during development. You will want to design a system that will check for data entry errors or incorrect cause-of-death coding based on data entry errors. Additionally, make updates or changes to your system if you see frequent errors such as incorrect spellings of the names of cities or abbreviations for cities. Data quality issues still might occur, so plan to have reports developed to review the data at the health department or vital statistics office. One option is to have someone review the cause-of-death information on all or a percentage of the cases to ensure proper data entry. This can be especially helpful in the beginning as your jurisdiction is transitioning from paper to electronic forms. Examples of quality checks include the following:

- ❖ Review 50% of reports weekly until a less than 10% error rate is found for key items in the EDRS report.
- ❖ Review 20% of reports weekly until an error rate of between 5% and 10% is achieved for key items.
- ❖ Continue to review 10% of all records weekly for 1 year until a less than 5% error rate is achieved for key items. Key items include: Name, sex, Social Security number, date of birth, spouse's name, maiden name, if applicable, decedent's address, was decedent of Hispanic origin, race, occupation and industry of decedent, location of death, date of death, time of death, actual or presumed date of death, actual or presumed time of death, medical examiner/coroner contacted, manner of death, accident/injury, if applicable, and cause of death.
- ❖ NCHS provides validation and verification error reports on many key variables. Jurisdictions should review these reports. They can also use the NCHS reports or develop their own to quality check and monitor their data entry.
- ❖ If an issue is found, be sure to track and follow up to ensure corrections were made accurately and issues were resolved.
- ❖ User training and system issues should be addressed and data continually monitored to identify areas needing improvement.
- ❖ Additional monitoring or edit checks and retraining should be developed based on errors observed.

Finally, another idea is to run frequency reports on key variables such as demographics, month/day of death, time of death, manner of death, and returned coded causes of death to look for any anomalies that might be in the data. This will allow a jurisdiction to detect anomalies that may indicate a systemic problem for follow-up.

Evidence to Insight—Summary Information of the Twelve Previously Funded Jurisdictions

Twelve jurisdictions previously funded by CDC to implement EDRS were interviewed to gain a better understanding of their EDRS and implementation processes. Table 8 is a summary of the EDRS in these 12 jurisdictions and their implementation and training methods. Notably, there is not a one-size-fits-all EDRS, rollout, or training method. A number of factors went into their decisions regarding the type of system adopted and the implementation and training methods used, including size of the state, funding, and state staffing availability. One benefit found across all jurisdictions was stronger relationships with their stakeholders working to collect death certificate data. Additionally, many found funeral home directors were a great help in recruiting and training medical certifiers to use the EDRS. Some common challenges the states faced were creating system user accounts in a timely manner and recruiting medical certifiers to use the EDRS. Overall, implementation of the EDRS in each jurisdiction increased the timeliness of reporting deaths to NCHS and other government organizations such as SSA.

Table 8. Summary Information of Previously Funded States Implementation Methods

State/Jurisdiction	EDRS Developer/Name of System	Rollout Method	Training Method(s) Used	Medical Examiner State	Coroner State
Arkansas	Mantech/Electronic Registration of Arkansas Vital Events (ERAVE)	Statewide Launch	Webinars or in-person trainings at association meetings, one-on-one training via the help desk, provided training materials so hospitals could train their staff	No	Yes
District of Columbia	Gold Systems	One Facility at a Time	In-person, videos, trained an expert on site	Yes	No
Florida	Netsmart/Florida EDRS	Regional	In-person workshops for each stakeholder group, online EDRS user manual in the system, handbook, video trainings	Yes	No
Idaho	Genesis Electronic Death Registration Developed by Idaho Department of Health and Welfare	Statewide Launch	In-person	No	Yes
Iowa	Netsmart	Statewide Launch	In-person, webinars, in-depth user guide, train-the-trainer	Yes	No
Louisiana	DB Sysgraph/Louisiana Electronic Event System (LEERS)	Statewide Launch	No training required to use the system. The system has built-in checks and balances. Optional trainings included DVD, integrated help guide, online training videos	No	Yes

Table 8. Summary Information of Previously Funded States Implementation Methods (continued)

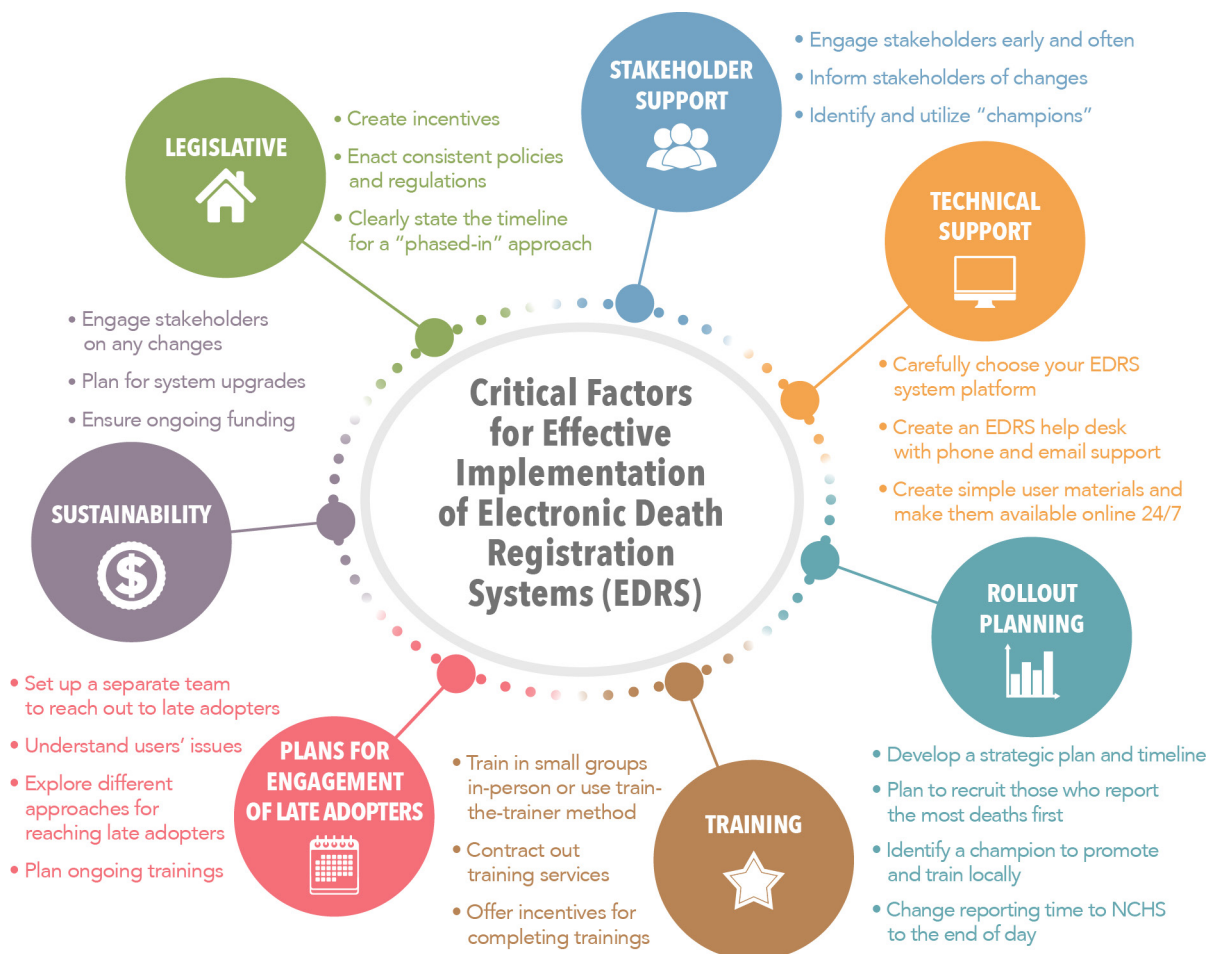
States/Jurisdictions	EDRS Developers/Name of System	Rollout Method	Training Methods Used	Medical Examiner State	Coroner State
Maine	Vitalchek/ Database Application for Vital Events (DAVE™)	Regional	In-person, remote	Yes	No
Massachusetts	ManTech	Statewide Launch	In-person, practice environment in system	Yes	No
New Mexico	Vitalchek/DAVE	Regional	In-person, small group training	Yes	No
New York City	Vitalchek/DAVE	Biggest hospital first	In-person, remote	Yes	No
Oregon	Vitalchek/DAVE	Regional	Train-the-trainer, super users, in-person, webinars	Yes	No
Wyoming	Developed by Wyoming Department Health Vital Statistics Services	Statewide (whole state went digital on the same day)	In-person, video, user guide, step-by-step guidance over the phone	No	Yes

Critical Factors and Effective Methods and Tips

The information below and in the Appendix provides a quick reference to critical factors and effective methods for the implementation of electronic death registration systems. Displayed in Figure 2 are the key tips associated with each of these critical factors.

Security Tip: As with any computer system that has personally identifiable information, you should incorporate proper security measures to protect against fraud and improper use. Regulate user accounts and remove a user’s access if he or she leaves a position or the jurisdiction. Strong passwords should be required for all users, and they should be changed frequently. Additionally, your system should have reports and checks to ensure accurate filing of death certificates.

Figure 2. Critical Factors for Implementing an EDRS



Understanding the critical factors and effective methods is only part of the process. Figure 3 displays a roadmap of the important steps to developing an EDRS.

Figure 3. Roadmap for EDRS Implementation



Lessons Learned From Previously Funded Jurisdictions

Jurisdictions that previously received funding from NCHS experienced some hurdles with the implementation of their EDRS. The main hurdles included the following:

- **EDRS account creation in timely manner**—The creation of user accounts was often complicated and time consuming. Some jurisdictions required hard-copy forms with signatures. Processing thousands of forms while also launching the EDRS proved to be difficult.
- **Physician staff mobility related to account creation**—This is particularly important when the account is associated solely with a hospital. For example, in some cases all doctors in a particular hospital were given the same username with individualized PINs, which caused problems when doctors moved to different hospitals.
- **Recruiting and encouraging medical certifiers to use the system**—Using Internet-based systems requires a unique username and password. Some medical certifiers complained about having to remember another username and password for the EDRS. Additionally, medical certifiers may have difficulties in adopting the EDRS because they feel they have no time to learn the new system, particularly if they will use it infrequently. Also, they may not be sufficiently computer savvy to use the system. They do not see the benefits compared with completing a paper form they know so well.

Tips from lessons learned include:

- ❖ Plan for user registration by either allowing time before launch or during launch for account creation.
- ❖ Make user accounts flexible or individually based so that they can be transferred to other hospitals easily.
- ❖ Have specialized outreach to late adopters and take extra time to get them on board.

Tactical Planning

With any new system implementation, there are challenges to overcome. The sections below provide more detail about challenges you may encounter and ways to plan for and address them.

Adequate Funding

Funding is important. You need money to develop, maintain, and update the system. Additionally, you need funding to transition from paper to an electronic system and to train all stakeholders in the new system. The funding needed is over and above the normal operating budget of most vital statistics departments. You will need to seek additional funding from your jurisdiction and possibly grant funding to support the

change. Moreover, when you implement an EDRS, you will need to estimate the cost of maintenance and updates and determine how to secure the needed funding.

Technical Expertise and Support

One challenge many jurisdictions face is not having the technical expertise and support within their jurisdiction for this type of system. You will need someone with knowledge of information technology (IT) systems to help you determine which system is best for your jurisdiction. After the system is chosen, you will need someone with experience in IT system design to help you with the development and design process. After the system is up and running, a system lead will be needed to help troubleshoot issues, correct errors, and install future updates. Having knowledgeable, experienced IT support is very important throughout the development, implementation, and maintenance of the system.

When selecting a system it is helpful to consider the following factors:

- ❖ The system should be able to be easily integrated with existing systems used by the jurisdiction.
- ❖ The system should be easy for all stakeholders to access and use.
- ❖ The account creation and management process should be user-friendly.
- ❖ The system should be sustainable and cost-effective. It should be relatively easy to upgrade to accommodate future changes in technology without high cost.
- ❖ The user list should be easy to manage to allow for rapid notification and dissemination of new information.
- ❖ The system must meet the current and future NCHS edits and requirements.
- ❖ It should be able to accommodate the various quality-control programs designed to be integrated with an EDRS, such as VIEWS.

Most importantly, the system should be customizable to fit the specific needs of a jurisdiction. When choosing a system, it is important to allocate resources wisely. Be sure to allow sufficient funds to pay for user training, help desk support, and future system upgrades. Also, have sustainable technical expertise to support the system from development through launch and through any updates and changes.

Sufficient Infrastructure

EDRS systems should not be developed in a vacuum. Work with your jurisdiction's IT department to ensure it works with other systems in your jurisdiction. Additionally, when you start to roll out the system, it needs to be simple enough to access so that your users can log on and fill out the form. If users need to download or install software, this step will hinder them from accessing the EDRS.

Connectivity to the Internet

One problem you will find, especially in rural areas, is Internet connectivity. The EDRS is often a web-based system that requires Internet access. Remote funeral directors or doctors who do not have Internet access will not be able to file electronically. You may want to look at options such as a mobile device application to make your system accessible to these users.

Updates, Revisions, and the Future of EDRS

Plan for future updates and revisions to your EDRS. The death certificate data collection form is updated periodically, so there is a chance it will be updated again, requiring changes to your system. Another consideration is new technology and making your systems mobile-accessible. Creating websites using HTML5 allows users to access them on their mobile devices and gives them more ways to complete death certificates. If you plan to use mobile technology, keep data security features in mind. This may be especially useful for coroners and medical examiners who want to report a death from the field. Plan for periodic review of your system to accommodate changing technology.

Appendix

Quick Reference Guide:
Critical Factors and
Effective Methods in the
Implementation of
Electronic Death Registration Systems

Introduction

The information below provides a quick reference to critical factors and effective methods for implementing electronic death registration systems (EDRS) on a statewide basis. There are key points associated with each of these critical factors and then a few ideas on ways to make it work in your jurisdictions.



Critical Factor: Stakeholder Support

The support of all of the stakeholders is critical to obtaining 100% usage of the EDRS. It is important to get the stakeholders involved early in the development process and keep them informed as usage increases and/or the system changes. It is also helpful to get the support of management in hospitals or hospital systems or the executive board of the appropriate professional organizations so that the support and enthusiasm for EDRS implementation is championed from the highest levels in every organization.

Key Points

- Engage stakeholders early in the EDRS development process
- Involve stakeholders throughout the EDRS development, launch, implementation, and maintenance process to obtain and keep their buy-in on the system
- Engage “champions”—work with stakeholder leaders to have them spread the word to their constituents to promote the EDRS. They can also be local technical support and help with registration
- Inform stakeholders of any changes to the system
- Have someone from the state vital statistics office participate in professional associations and serve on association boards, if appropriate



Ideas to Make It Work

- ✓ Include a representative from each group of stakeholders (e.g., executive director of the association of funeral directors, a member of the Board of Medicine, and a county registrar) on the team that designs the system and plans the rollout
- ✓ Start a user group of industry experts from each stakeholder group who will help develop the guidelines and workflows of the system
- ✓ Present at association meetings, such as state funeral directors’ meetings
- ✓ Send e-mails and newsletters containing useful information related to the system
- ✓ Attend regular meetings of the appropriate professional associations; if possible, have someone on the board so that there is direct access to stakeholders. Be available to members for questions and feedback and provide regular feedback on accruals and status.
- ✓ Take advantage of user groups created by certain vendors



Critical Factor: Legislation

Several states have legislation mandating the use of an EDRS, which strongly supports the implementation process. However, differences in the legislative mandate, such as the required timeline for implementation and reporting requirements for various entities (e.g., large or small hospitals, funeral homes), may make the process less straightforward. In some jurisdictions, EDRS implementation is not mandated by state law; however, it is regulated by the state registrar who has the authority to require electronic records. Legislation or regulatory requirements can fully support the rapid implementation of electronic death reporting.

Key Points

- Legislation strongly supports EDRS implementation
- Consistent regulation and enforcement (across institutions, facilities, and regions) most beneficial



Ideas to Make It Work

- ✓ Create incentives for electronic completion during implementation (and penalties for those who do not comply after rollout is complete)
- ✓ Enact consistent policies at the outset of implementation and clearly state the timeline for a phase-in approach
- ✓ If allowing for a phase-in approach, allow for a hybrid system of reporting on a temporary basis to obtain at least some of the information electronically (e.g., allow “drop to paper” or fax attestation options) until a full electronic option is viable



Critical Factor: Technical Support

It is essential to provide user support to EDRS users, especially during the implementation period. One way to reduce the level of support required is to carefully choose your EDRS. The initial selection of the EDRS software to be used should take into account compatibility with other state IT systems, capacity for ongoing state information technology (IT) support of the EDRS, and software vendor support for the system. Internal technical support for the system can be composed of an EDRS help desk, online materials such as user guides and Frequently Asked Questions documents, and management of user lists so that users quickly receive information and notifications when updates or new user materials become available.

Key Points

- Ensure that EDRS software is compatible with state IT infrastructure and ongoing IT support is available
- Create an EDRS help desk with phone and e-mail support that go beyond traditional work hours
- Create simple user materials and make them available online 24/7 so users can answer their own questions
- Manage user lists for rapid notifications and dissemination of new information and updates



Ideas to Make It Work

- ✓ Assign dedicated and knowledgeable staff
- ✓ Triage calls through either an automated menu or live person to ensure the user reaches the correct help swiftly
- ✓ Have extended hours with night and weekend coverage during peak launch activities if possible; hours can be reduced as implementation progresses
- ✓ Have someone available via e-mail for extended hours to address lock-out issues
- ✓ Post user guides, documents containing answers to Frequently Asked Questions, PowerPoint presentations, webinars and videos, and quick user guides on a state website



Critical Factor: Training

A critical factor to any EDRS rollout and successful EDRS implementation is training. Ensuring all users are trained properly is key to getting users onto the system and making them want to continue to use it. If the users find it is easy to use, can learn the system quickly, and find that it will save them time, they will want to use the system.

Key Points

- Best type of training is in-person small group training; if in-person small group training is not possible, conduct in-person train-the-trainer sessions
- If in-person training is not practical, webinars can be employed



Ideas to Make It Work

- ✓ Hold in-person trainings centrally in the state capital or regionally for hospital staff, registrars, or health departments; local personnel can be champions of the EDRS and provide local support to other users
- ✓ webinars should be set up for small groups and be engaging to ensure users understand the system and ask questions about issues they do not understand
- ✓ Employ the shared concern approach explaining how the EDRS will benefit the hospitals and physicians and how the jurisdiction can help them implement the system
- ✓ Provide incentives such as Continuing Education credits to encourage training completions or food during training sessions



Critical Factor: Rollout Planning

The success of persuading stakeholders to utilize an EDRS is dependent on how well a jurisdiction implements the system. Jurisdictions have adopted either a statewide “blitz” or a regional phased approach; both methods are effective as long as a strategic plan and timeline are developed.

Key Points

- Two methods: statewide “blitz” or regional phased approach
- Both approaches are equally effective if properly planned from the beginning
- Develop a strategic plan and timeline and adjust as needed
- Identify champions to promote and train on the system at their facility or in their association



Ideas to Make It Work

- ✓ The statewide approach is especially effective if state legislation has been enacted for EDRS implementation, there is stakeholder support, the state is geographically small, and if the EDRS does not require much training to use
- ✓ The regional approach works best for states that do not have legislation or regulatory requirements to implement the use of EDRS, do not have strong stakeholder support, or have an EDRS that requires significant training
- ✓ With both approaches, continued outreach is needed and help desk support is critical.



Plans for Engagement of Late Adopters

Initial rollout may not be enough to encourage all stakeholders to utilize the EDRS. There are always a few holdouts who for many reasons do not feel they can use the EDRS. States should do their best to first understand why the user does not want to submit death reports electronically. Is it a technology issue or lack of training or training opportunities? Users may have issues with technology or they may be infrequent users and do not want to or do not have the capacity to learn a system. A state needs to understand its users and determine the best approach to engage them.

Key Points

- Understand why the user does not want to submit death records electronically
- Set up a separate team to reach out to late adopters
- Plan ongoing training for new users and re-trainings for current users of the system



Ideas to Make It Work

- ✓ Take the time to understand the issues or difficulties encountered by late adopters and determine the best approach to engage them
- ✓ Contractors can help with late adopters by freeing up state staff time to focus on registration, help desk support, and data processing
- ✓ Explore different training options
- ✓ Explore the possibility of adding time for EDRS training when other training opportunities are scheduled (e.g., combine with cause of death training)



Critical Factor: Sustainability

After an EDRS system is implemented in a jurisdiction, the work continues. A jurisdiction must plan to sustain the system; like any technology, it will need upgrades to the software and hardware. If a state does not plan for changes in the technology, it will lose stakeholders' support and have difficulties processing the data. Jurisdictions need to ensure there is funding to deploy, engage, and update their EDRS.

Key Points

- Plan for system upgrades to the EDRS software and hardware
- Ensure there is ongoing funding to deploy and update the EDRS and maintain user engagement
- Be flexible to incorporate necessary changes to the EDRS or processes that will improve outcomes such as timeliness, quality, and usability



Ideas to Make It Work

- ✓ Work with system developers to keep up with technology
- ✓ Explore possible funding sources, such as fees from the issuance of death certificates, Social Security Administration incentive payments, grants, and jurisdiction funds