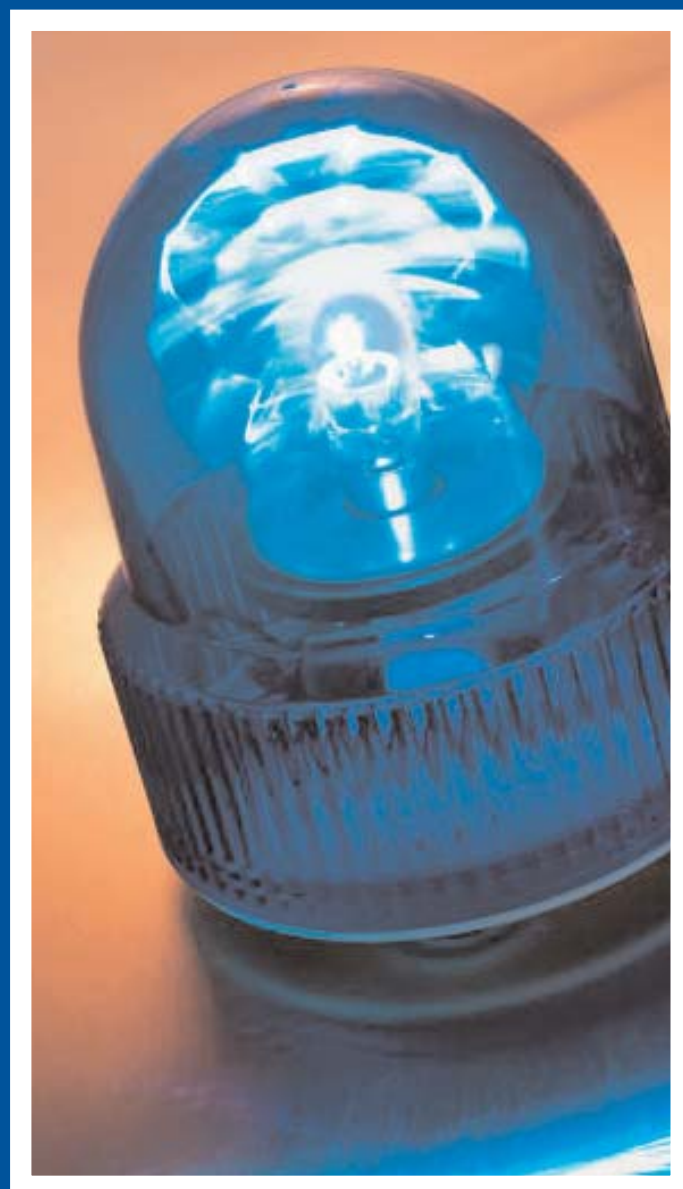


THE NATIONAL VIOLENT DEATH REPORTING SYSTEM

LESSONS
LEARNED FROM
17 STATES:
2002-2006



About STIPDA

The State and Territorial Injury Prevention Directors Association (STIPDA) is a national non-profit organization of professionals committed to strengthening the ability of state, territorial and local health departments to reduce death and disability associated with injury and violence. To advance this mission, STIPDA engages in activities to increase awareness of injury - including violence -- as a public health problem; provide injury and violence prevention education, training and professional development for those within the injury and violence prevention field; enhance the capacity of public health agencies to conduct injury and violence prevention programs; and support public health policies designed to advance injury and violence prevention.

For more information about STIPDA please contact the STIPDA National Office at the following address, or visit the STIPDA Web site at www.stipda.org.

State and Territorial Injury Prevention Directors Association
2965 Flowers Road South, Suite 105
(770) 690-9000, (770) 690-8996 Fax
www.stipda.org

Suggested citation:

The National Violent Death Reporting System: Lessons Learned from 17 States, 2002-2006. Atlanta (GA): State and Territorial Injury Prevention Directors Association; 2007.

The development and publication of this document was made possible through funding from CDC's National Center for Injury Prevention and Control (Cooperative Agreement U50/CCU423402). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of CDC.

TABLE OF CONTENTS

Executive Summary	3
Lessons Learned from 17 NVDRS States: 2002-2006	
Cooperative Agreement Application	5
Partnership Development and Maintenance	11
Getting Started	23
Staffing	25
IT and Computer Programming Support	33
Data Management	38
Data Coding	47
Data Analysis	49
Data Quality and NVDRS Evaluation	53
Appendices	
Appendix A: Initiating a Violent Death Case for the NVDRS	55
Appendix B: NVDRS Resources	56
Acknowledgements	57

EXECUTIVE SUMMARY

Seventeen states are currently funded through cooperative agreements with the Centers for Disease Control and Prevention (CDC) to implement the National Violent Death Reporting System (NVDRS), a state-based, national reporting system to track the incidence and characteristics of violent deaths. NVDRS collects data on violent deaths from death certificates, police reports, medical examiner and coroner reports, and crime laboratories. This innovative surveillance system brings together fragmented, sometimes inaccessible data to provide a more comprehensive picture of violence that leads to fatalities. With an improved understanding of the risk factors and circumstances of violent deaths, steps can be taken to develop and test prevention measures and disseminate successful prevention plans.

Since the first group of NVDRS states was funded in 2002, the state health departments (and in two states, the state medical examiner's offices) implementing NVDRS have been building not only an important new surveillance system, but a wealth of insight and understanding about what this effort entails. In 2006, the State and Territorial Injury Prevention Directors Association (STIPDA), through its cooperative agreement with CDC, conducted telephone interviews with NVDRS program staff in all 17 states for the purpose of gathering detailed information about states' experiences applying for, implementing and evaluating the NVDRS. Staff from each state generously shared information about the challenges they encountered and the specific strategies they used to work through these challenges in applying for, implementing, staffing, analyzing data from, and evaluating the NVDRS.

This report compiles these lessons learned and strategies for improvement. The report is intended to benefit states planning to apply for an NVDRS cooperative agreement - as well as those in the first year or two of implementation - by demonstrating how to smooth and accelerate the application, the set up and the implementation of the NVDRS in a state, and avoid repeating common dilemmas in these processes. Even states without the intent or current capacity to apply for an NVDRS cooperative agreement could benefit from this document, given that all state injury and violence prevention programs need to consider the complex components of injury and violence surveillance, such as access, authority, confidentiality, partnerships, and data analysis and dissemination.

Highlights of lessons learned and practical strategies for working with the NVDRS include:

Cooperative agreement application

- A combination of factors, rather than a single one, resulted in a successfully funded application.
- Invest time upfront with each major data source to share what is needed for the NVDRS and to develop as detailed an understanding as possible of how those data source agencies operate.
- Establishing the requisite memoranda of understanding (MOUs) with each data source requires many skills and considerations, from relationship building to data and IT expertise, staffing capacity, budgets, and legal processes. Establishing MOUs in advance during the application process was helpful, but the process was time consuming and required advance planning.
- Within the state health department and among the other agencies that house the requisite NVDRS data, address concerns about the legality and confidentiality of providing, linking and ultimately disseminating these data.

Partnership development and maintenance

- Partnerships were helpful for getting a state's violent death reporting system up and running, maintaining the system, generating ideas for useful data analyses, and disseminating the results of those analyses to individuals and agencies that can put them to use.
- Allocate sufficient staff and time for an ongoing nurturing of the partnerships, and, when inevitable personnel changes occur, for building these relationships anew.
- While working towards a common goal of a statewide violent death reporting system may be enough to bring some partners on board, creative sharing of resources has proven to be a practical, effective method to gain cooperation and participation from key data sources and prevention partners, and to maximize the impact of a state's NVDRS program. Strategies include sharing data, supporting related systems, offering tangible incentives, sharing staff

expertise, and providing monetary and/or in-kind support.

Getting started

- Three program set-up activities frequently cited as taking longer than anticipated were hiring staff, installing NVDRS software and addressing IT problems (e.g. maintaining a central server for storing and transmitting data, transmitting requisite data to CDC).

Staffing

- Among the myriad of skills that collectively may exist among the staff members of a state's NVDRS program, three areas considered essential were building and maintaining relationships, working with data and having IT expertise.
- In addition, data abstractors are one of the most important pieces of the NVDRS staffing equation. Abstractors should be critical thinkers who have mastered attention to detail, can handle repetition and can function in a sometimes rudimentary work environment. Allotting sufficient resources to hire and retain such individuals should also be taken into consideration.
- To prepare for potential turnover among abstractor staff, grantees recommended cross-training staff within and outside of the NVDRS program (e.g. traumatic brain injury staff).
- Given the violent, graphic and often tragic nature of the cases that are part of a state violent death reporting system, grantees emphasized the importance of staying attuned to the mental health needs of staff. Working as a team, maintaining good communication, having diverse program responsibilities, and checking in with staff members individually or during staff meetings may help.

IT and computer programming support

- Establishing adequate IT and computer programming support in advance - ideally, during the cooperative agreement application process - can expedite the surveillance system set-up, provide needed support during other NVDRS program activities, and save time and money.
- Make a realistic assessment of - and communication about - the IT and computer programming support needed for setting up a secure server, installing the requisite NVDRS software, working through data security issues, conducting requisite CDC software updates, transmitting data to CDC, and accessing data for analysis. The amount of IT and/or computer program assistance needed typically was more than grantees anticipated, particularly during program set-up.

Data management

- Even when a data set is available electronically, hand-abstraction of data into the NVDRS database may be necessary to ensure timeliness of data access, collect variables that are not included or do not match the standard variable fields when data are electronically imported into the NVDRS database, and/or avoid confusion in terminology among data sources.
- Adjustments with data sources may be necessary to collect the requisite data or identify and match deaths with other NVDRS data sources (e.g. revise a data agreement to include all variables needed, expand law enforcement data collection to include local jurisdictions).
- Plan for the inevitable lag time that occurs along the continuum of data collection, analysis and dissemination.

Data analysis

- In addition to basic descriptive epidemiology practices and CDC cooperative agreement requirement, other factors shaped states' decisions about the focus, organization, format, timing, and audiences for NVDRS data analyses. These include input from NVDRS data sources, advisory group members and other violence prevention partners, as well as the desire for analyses to reflect the unique and powerful capabilities of the NVDRS.

Memorandums of Understanding (MOUs)

Grantees found that establishing signed MOUs with the requisite NVDRS data sources was the most challenging and time consuming step in preparing an NVDRS application. Establishing these MOUs requires many skills and considerations, from relationship building to data and IT expertise, staffing capacity, budgets, and legal processes. Lesson learned relevant to the MOUs can be found throughout this document, but it is worth briefly reiterating some benefits and potential limitations of these MOUs.

Grantees reported that establishing MOUs in advance during the application process were helpful, but the process was time consuming and required advance planning. The process may require balancing the needs of data sources with the CDC RFP requirements.

"Even though at the time it was very labor intensive and more than we've had to do with another grant, once we received a grant, everything was in place and ready to go. The front-end work helped a lot."

"The real catch is having the MOUs in place and already established relationships with key data providers. Otherwise you're fumbling around trying to get them established."

"For our first time applying, the time required to have the MOUs in place, that was a barrier... it was a struggle to do that. It takes weeks for request to go through legal departments, etc."

"MOUs can be difficult to get... At the state health department, they're considered legal documents and they have to go through the state health department and the Attorney General's office, so that was most time consuming part of application. It's something for states to consider: what are the steps within their own health department for agreements with other agencies, even if money is not involved?"

"The data agreements are key. Make sure they spell out all the variables that you need."

Grantees found that establishing signed MOUs with the requisite NVDRS data sources was the most challenging and time consuming step in preparing an NVDRS application... the process was time consuming and required advance planning

"The RFP required that we have MOUs in place with data agencies, so we had those and some level of partnership (which has evaporated since then) due to change in leadership and them not taking it seriously."

Despite the advance planning and agreements established in MOUs, some grantees found that they did not always guarantee partner collaboration and not all data sharing challenges could be predicted prior to program implementation.

"The RFP required that we have MOUs in place with data agencies, so we had those and some level of partnership (which has evaporated since then) due to change in leadership and them not taking it seriously."

Staffing Capacity

Grantees reported a variety of staff skills and experience that were helpful not only in applying for the NVDRS cooperative agreement, but also for getting the program started once funded. Grantees underscored the need for staff skilled in grant-writing. A team approach was recommended. In one state, the injury epidemiology program and the offices of the state's vital records and the state medical investigator pulled together to write the application. State health department staff in another state worked with two university faculty members to develop a plan for implementing and running the state's violent death reporting system. Staff from yet another state put it this way:

"The key factor was that we delegated some staff to be available immediately upon time of funding to get the system in place. We committed a portion of [staff member]'s time to make sure we could get the project up and running."

"What was needed was state staff to devise a plan for how to best accomplish the goals of NVDRS... state staff were needed to form relationships with county personnel to recruit data providers, develop a protocol and put MOUs in place."

Some states recommended that existing staff members (or a portion of their time) be immediately available once the state received NVDRS funding. This approach can be helpful when hiring freezes beyond the control of the program may delay hiring NVDRS program staff.

"The key factor was that we delegated some staff to be available immediately upon time of funding to get the system in place. We committed a portion of [staff member]'s time to make sure we could get the project up and running."

"We had staff to write the grant, but we also had experienced senior epidemiologists who could manage it."

Detailed Discussions with Each Major Data Source

In preparing an NVDRS application, grantees emphasized the importance of investing the time upfront with each major data source to share what is needed for the NVDRS and to develop as detailed an understanding as possible of how those data source agencies operate. This includes the structure and staff of the agency that houses the data, the exact location and format of the data, the process for sharing and/or transmitting the data, and any potential challenges the data source faces in participating in the state's violent death reporting system. Grantees found that gathering this specific information also makes for a smoother set up and implementation of a state's violent death reporting system.

"It takes time to develop a comfort level. We had at least two meetings with each data provider to review what we're looking at, how we're collecting the data, how it's stored, how we'd get the data from them, and to make sure we weren't going to be a burden on their system in providing the data to us."

"We faced law enforcement jurisdictional barriers. We have more than 600 jurisdictions, so we're trying to find other ways to get those data. It's like following a goose chase sometimes to find where the data go, if there's mandatory reporting, and if it's not mandatory, what percent of deaths do get reported and if it's worth pursuing that source or should we go elsewhere to find what we need."

"If you think about it from a law enforcement perspective, some cases will be pending for five years. Knowing what they can provide us, we can go to the district attorney and say what we actually need is just the case narrative. We don't need copies of the three inch binders of testimony and other documents for a trial proceeding. We had to clarify when applying for NVDRS and for the MOUs that we don't want reams of paper from them. We want very concise information as part of a report narrative. If more information is needed, we can go in and specifically ask for it."

Understanding terminology is also important. When it met with a data source, especially if it were law enforcement, one state health department would bring its staff members who worked directly with data and could "talk the same lingo" with their data counterparts at the other agency. Staff from another state health department pointed out that the definition and coding of a seemingly common term (e.g. victim) may vary among the various agencies that provide data for a state's violent death reporting system. Grantees cautioned that even with this upfront work, challenges to getting and using data from each data source may not be apparent until work with actual data begins. Staff from one state echoed a challenge experienced by other states:

"Even though we had MOUs, they couldn't really provide anything until we started, and at that point, we learned of shortcomings and problems. To the extent possible, it's important to work out in advance the issues of delivering and formatting the data, the location of the data and how the transfer will be made."

For other ideas about communicating with data sources and program partners, see information on communicating program details on page 14 under the Partnership Development and Maintenance section.

IT Support

A lesson learned cited by most grantees was the need to establish means for adequate IT support in advance - even at the same time that MOUs with key data sources are being developed for the NVDRS application. Some grantees have dedicated IT staff within their organizational unit to provide this support, while others rely on a separate IT department that serves the entire state health department. Regardless, most grantees reported that they underestimated the level of IT staff time and resources needed to develop and maintain the state's violent death reporting system. Even though IT support is provided through an NVDRS help desk at CDC, some grantees found that they would have benefited from a better understanding of how to install the NVDRS software application on state computers or servers and how to transmit requisite data to CDC. The IT support available within the other state agencies that provide the requisite NVDRS data (i.e. the medical examiner's office) also should be considered, as IT assistance may be needed for data transfer activities or issues related to servers and software.

"The concept of having an MOU with different data providers was great, because it puts states ahead of game. . . . The same thing should have been done with IT departments. It's been our biggest obstacle so far. . . . One thing we didn't have to do but should have had to do, was to demonstrate that our state's IT infrastructure was compatible with CDC's NVDRS software application. . . . In hindsight, the application should have required our [IT department] to review the NVDRS software application specifications and signed off on them."

"...the relationship with IT and the adequate staffing for abstraction were things we only realized we needed after we got the grant and it was obvious that this was not just linking data files in SAS and submitting them to CDC annually, like was done for TBI."

"You need to have a strong IT staff, and you better have an MOU with them that they have to work hard at the front end to get this going."

Grantees also recommended addressing possible data security issues and requirements of the state health department and each of the major NVDRS data sources. For example, the IT department within a state health department or other state agency providing NVDRS data may have more stringent data encryption and other data security standards than those required by the NVDRS RFP.

"The IT situation has been changing in [state]. In the last couple of years, data security issues have become absolutely huge. We used to operate with much less IT oversight than we do now and I don't think that will end. Think it will be a huge issue for future [NVDRS] states within the context of changing IT rules, especially data security."

Budget Considerations

Grantees also offered lessons they learned in preparing an NVDRS program budget. Some states found that the costs of collecting the requisite data were greater than anticipated. For example, the per capita cost of collecting data on a violent death in a geographically large state with a relatively small population and relatively few violent deaths may be greater than a state with a much larger population and one or more centralized data sources with electronic transfer capability. As noted in the "Partnership Development and Maintenance" section below, the staff and time resources of building and maintaining relationships with data sources and other program partners should be taken into consideration.

Coordination with End Users of NVDRS Data

Collaboration with end users of NVDRS data can be an important step in preparing an NVDRS application. For example, the injury and/or violence prevention program within the state health department may not be the organizational unit applying for the NVDRS cooperative agreement, but it likely can put the data generated by the state's violent death reporting system to effective use. Staff from one state's injury prevention program described how this early collaboration can strengthen a state's NVDRS application and overall program planning:

"We would hope that the project can inform programmatic efforts, so having the injury and violence prevention program involved would have helped tie the program back to prevention and forced us to think through what kind of questions we wanted to answer, what kind of programmatic information we wanted to have. It shouldn't be all about getting the data... It helps if the program is more involved to help the [NVDRS] program understand what it needs to be looking at as far as how the data are collected and analyzed. The stream should go both ways and make that link to programs."

"It helps if the injury and violence prevention program is more involved to help the [NVDRS] program understand what it needs to be looking at as far as how the data are collected and analyzed. The stream should go both ways and make that link to programs."

"We decided collaboratively in conversations with the medical examiner's office, the center for health statistics and the injury prevention program that we'd have the medical examiner be the primary investigator."

This kind of collaboration was described by an injury prevention program staff member from a state where the state medical examiner's office took the lead for the cooperative agreement.

"We decided collaboratively in conversations with the medical examiner's office, the center for health statistics and the injury prevention program that we'd have the medical examiner be the primary investigator and center for health statistics be very involved...because they're the ones that house the needed data sources... The injury prevention program was involved in discussions during the application for NVDRS, and I drafted the first round of MOUs and did lot of the wheeling and dealing at beginning."

Legal issues/confidentiality

In preparing NVDRS applications and negotiating signed MOUs, grantees often faced concerns - both within the state health department and among the other agencies that house the requisite NVDRS data - about the legality and confidentiality of providing, linking and ultimately disseminating these data. These concerns existed despite the measures that CDC has put in place to protect the data and address confidentiality concerns. The concerns included:

- Maintaining data confidentiality
- Linking data, including linking data variables that are not part of public record (e.g. confidential medical information from medical examiner files) to data that are part of public record (e.g. vital statistics data)

“The data linking concern was that...we'd create new file that would have a scope of information that had not previously been available, or available only with great difficulty...that we'd made it easy to find out not only that John Smith died on X date...but that he was depressed last week, he lost his job, etc.”

- Having adequate data release guidelines

“Particularly for suicides, medical examiner records have information not just about the people who died, but also those alive, family members, so there was a great concern that if we didn't have very strict data release guidelines, someone would be able to identify a person in our aggregate data and have info that they didn't have before.”

- Releasing data to CDC (e.g., how will confidentiality be ensured, what will CDC do with data)

To respond to these concerns and others, grantees found some approaches to be helpful, such as including confidentiality agreements in the application MOUs, having legal counsel and/or the state attorney general review the MOUs, and including the data sources in the decision-making process.

“I wrote agreements with confidentiality protection and data sharing issues into the MOUs, then let them run them by their legal counsel. Once we got one agency to sign on, we could say ‘so and so is doing it.’ Getting the first one is the hardest. We had vital records, so that was where we started.”

One grantee included a statement in the MOU that either party could terminate the agreement in 30 days; although this did not have the power of a binding agreement, the grantee reported that it did provide the program with some leverage.

“I wrote agreements with confidentiality protection and data sharing issues into the MOUs, then let them run them by their legal counsel. Once we got one agency to sign on, we could say ‘so and so is doing it.’ Getting the first one is the hardest. We had vital records, so that was where we started.”

Another grantee described how her state's violent death reporting system program went beyond the protection provided by an MOU and obtained a certificate of confidentiality from CDC. According to the grantee, this certificate provides an additional layer of confidentiality by providing protection against subpoenas from state and federal courts for state-maintained violent death reporting system data. Originally designed to protect the privacy of research study participants by protecting identifiable research information from forced disclosure, the grantee said the certificate has been extended to cover other areas of public health and public health practice.

“This goes far beyond the protection provided by an MOU, as it recognizes the state-violent death reporting system database as a new source of information, inherently different from - and often more informative than - the secondary data that are obtained from the separate data sources.”

However, the grantee pointed out that to be eligible for a certificate of confidentiality, the state violent death reporting system must be reviewed and approved by an Institutional Review Board (IRB). According to the grantee, an IRB review - and its inherent question of whether a state violent death reporting system is surveillance or research - may not be a process that some states want to enter.

"I have to inform the state IRB of the data system I'm setting up, but the notifications [from the state IRB] always come back as exempt and the [state violent death reporting system] is deemed to be surveillance and not research... My attitude is that this is public health surveillance, outside realm of research..."

PARTNERSHIP DEVELOPMENT AND MAINTENANCE

NVDRS grantees shared strategies and lessons learned for developing and maintaining the partnerships necessary for all phases of the NVDRS program - from the application to the development, implementation and evaluation of a state's violent death reporting system.

Partnerships with data sources, end users of NVDRS data and other violence prevention partners are essential to most aspects of a state's violent death reporting system. Beyond the grant application and memoranda of understanding (MOUs), grantees reported that partnerships were helpful for getting a state's violent death reporting system up and running, maintaining that system, generating ideas for useful data analyses, and disseminating the data to individuals and agencies that can put the data to use.

"We can pull the program together and facilitate it, but others are the keepers of their data, so our relationships must be built on trust."

Inherent in this process, grantees found, was allocating sufficient staff and time for an ongoing nurturing of the partnerships, and, when inevitable personnel changes occur, for building these relationships anew.

"We have a wonderful model: patience, persistence and political astuteness."

"We can pull the program together and facilitate it, but others are the keepers of their data, so our relationships must be built on trust."

Developing Partnerships

Strategies for developing partnerships include starting with existing relationships, laying the groundwork early, taking time to build trust, and working with agency leaders.

Start with existing relationships

Existing relationships are good starting points for the partnerships needed to apply for and implement the NVDRS. The trust that comes from working together on previous projects, and in some cases sharing data, can facilitate and expedite the time and effort required to get a signed MOUs for the NVDRS application. Once funded, this trust can help a program to gain advisory group participation.

For example, the MOU process in one state moved relatively quickly because the injury prevention program had an established relationship with law enforcement and had demonstrated that it could provide quality information back to

communities around the state through its years of working with another federal program that monitors and disseminates prevention recommendations regarding occupation-related fatalities in the state. Another state injury prevention program reported that the MOU process was expedited due to the relationships it had previously established in developing a Violence Against Women surveillance system project.

Likewise, another state injury prevention program had built relationships through many years of working with the state offices of vital statistics and the medical examiner to receive electronic copies of injury data. Staff in another state injury and violence prevention program had been part of the state child fatality review team for years and had worked with law enforcement, district attorneys, the state attorney general, and the state medical examiner office and other medical examiners around the state.

Some grantees described how persons whom they had worked with on other projects were willing to use their own contacts to bring a key data source or agency on board with the NVDRS.

"When the MOU with the state police was being reviewed, they wanted to send it to the attorney general's office to review the surveillance statute to see if it allowed us to collect data from their surveillance. The attorneys that reviewed it could not agree, but because I have served with the attorney general, he said we'd approve it. Without that we wouldn't have gotten the MOU or the grant."

New relationships take time to build

When new relationships must be built for the NVDRS program, grantees reported - not surprisingly - that the process takes time. Grantees have held numerous meetings with data sources to provide information on the NVDRS program and to answer questions; they have included the data source agencies in decision-making; and, they have tried to demonstrate sincerity.

"States need to be prepared for things they essentially can't prepare for, and these outside events really can have an enormous impact on the project. Of course, sometimes the unexpected works to the project's advantage. States need to be ready to capitalize on those events as well."

"Establishing trust...you can't do it in one meeting. That's evolved over time. We've followed through on what we said we'd do. Confidentiality was a huge issue. We included our partners in any decision making when we'd be using their information or needing their input. We didn't speak for them, we included them. These partners were put on the advisory council. Everybody felt like their voice was heard on an equal basis."

"[The idea] that we could walk into the [state] bureau of investigation and ask for data - that's a real quick way to ensure that you won't get it. Instead, there have been lots of meetings, handholding, sending over information to show that this is a legitimate project. Now they do believe, but it takes a while to develop that trust. You have to let them know that you're sincere and trusting, that you have no other motive, and want to help them any way you can."

Even established relationships may need to be rebuilt in the middle of program implementation when personnel or administrations change.

"States need to be on top of what is happening in their state politically, as data agreements made with the 'old' attorney general may not mean as much in a new administration."

"I would mention the importance of what I call the 'serendipity factor'... In the past few months in [state], the medical examiner's office has made the daily headlines over problems in its facility, the director of our state crime lab was suspended, we have a new governor and a totally new health department administration coming in... States need to be prepared for things they essentially can't prepare for, and these outside events really can have an enormous impact on the project. Of course, sometimes the unexpected works to the project's advantage. States need to be ready to capitalize on those events as well."

Lay groundwork early

Beyond building partnerships, grantees recommended talking about the NVDRS, its requirements and its potential with key partners well ahead of time.

One NVDRS principal investigator began informing data providers and prevention partners of the anticipated NVDRS RFP well in advance of the RFP announcement and cooperative agreement application deadline. She got on their meeting agendas and talked with them about the NVDRS, the health department's intent to apply for the NVDRS, and what these partners would need to provide (e.g. data, signed MOU, letter of support). She provided information for partners to include in their newsletters.

"I went to the most important partners and told them that we were going to apply for the NVDRS grant, and that we'd need their help. I did that long before CDC even put out the guidance on the web."

"I went to the most important partners and told them that we were going to apply for the NVDRS grant, and that we'd need their help. I did that long before CDC even put out the guidance on the web."

Another program convened an informal violent death working group with key data sources and agency partners to talk about the NVDRS and potential data issues.

"We laid the groundwork for getting the MOUs signed, which was single most difficult piece of getting the application together. Having something together prior to funding has been helpful. It hasn't guaranteed anything...but it gives us some leverage."

Consider starting with agency leaders

To build relationships and get signed MOUs, some states found it helpful to begin the process at a high level within the agencies that own the data needed for the NVDRS.

"This project was different than other surveillance systems where we set it up from the bottom up. With this project, we pretty much had to work at a higher level. I used personal contacts to get people to call me back. I was very persistent."

The program manager in another state got a letter of support from the governor, and later was able to use the letter to facilitate participation from a key data source. She also set up an appointment with the lieutenant governor's chief of staff to describe what the NVDRS program was and how it could benefit the state. The lieutenant governor then talked with the state police commissioner, who in turn talked with the appropriate state police staff, which led to a signed MOU.

"Go as high up as you can. For example, the police are trained to protect data, but if they're told by their supervisors that it's okay to release the data, they'll be more willing to work with you. It's important to work with the person who works with data, but don't start with them. You want to be friends with everyone, but go as high up as you can."

Another grantee chronicled the steps she and her staff went through to build the necessary relationships and get signed MOUs.

"We went to the state health department director, who went to the secretary of health services, so with that level of support, we went ahead. Our biggest obstacle was that it took 18 months for me to convince the head of the state bureau of investigation to participate and to get an MOU. Once we had that, there was nothing to stop us. The medical examiner and the state center for health statistics were willing to share [data]. Then we had total infrastructure support."

Make partner participation worthwhile

While working towards a common goal of a statewide violent death reporting system may be enough to bring some partners on board, grantees underscored the importance of listening to data sources and other prevention partners to identify ways to make partner participation worthwhile.

"...we've had to think creatively about what we can do to provide them with something useful...just because we ask for it [data] isn't reason enough for them to want to help us."

"Getting a steady flow of data requires a lot of care of the data sources - reminding them of what we're doing is important, thinking of how it's relevant to these providers, thinking of how we can give something back beyond modest amounts of money, that's a challenge."

See more ideas about making partner participation worthwhile below under Sharing Resources.

"One reason that we have had such success, is that we took time upfront to talk with them [data sources] individually before doing the MOUs, to explain what we're trying to do."

Communicate program details, potential time and resource needs

Grantees recommend providing extensive detail upfront about the NVDRS so data sources and other program partners fully understand the program, their role in it, the time and resources required, potential uses of the NVDRS and its data, and the benefits of participation.

"One reason that we have had such success, is that we took time upfront to talk with them [data sources] individually before doing the MOUs, to explain what we're trying to do."

"Getting a steady flow of data requires a lot of care of the data sources - reminding them of what we're doing is important, thinking of how it's relevant to these providers, thinking of how we can give something back beyond modest amounts of money, that's a challenge."

One grantee suggested specifying the data needs within each MOU so these requirements are upfront and in writing. Another grantee suggested being clear about the program's developmental timeline.

"Let them know that the project is in its infancy, and it may take two to three years until it is really functioning in a way that seems timely and more real-time, so a fair amount of patience is required until we get to that point."

The time, resources and challenges of collecting NVDRS data - especially in states without centralized systems - may not be fully apparent until the program is underway. In hindsight, however, several grantees reported that partnerships with data sources would have been strengthened through detailed discussions about the time and the direct and/or in-kind resources needed for data collection.

Explore specific agency requirements and preferences

Familiarity with the specific requirements, processes and preferences of each disparate NVDRS data source within and outside of the state health department is essential to developing effective partnerships.

"The state police have twelve posts, and they didn't want me to go to each individual post. They wanted to give me all the data from headquarters, so I had to ask permission from the main data source contact. It was important to understand this so I didn't offend them."

Likewise, grantees recommended finding ways to minimize the burden of collecting the requisite NVDRS data by understanding the specific process and potential challenges a data source may face in providing these data. For example, when a law enforcement agency did not have sufficient administrative staff to copy reports containing data needed for NVDRS, state NVDRS program staff offered to send an abstractor to the agency to copy the reports. In another state, the state police crime laboratory would provide the necessary data only if funds were provided for a state trooper to abstract the data on-site at overtime rates.

"For the coroners and medical examiners, one thing they won't do is double enter. Even though we provide a single form, some just send us their case notes, and we put the information on the form for them. You have to make it easy for them to give you the information."

"For the coroners and medical examiners, one thing they won't do is double enter. Even though we provide a single form, some just send us their case notes, and we put the information on the form for them. You have to make it easy for them to give you the information."

Make realistic staff time and budget estimates

Several NVDRS grantees reported that they had underestimated the staff time - and a budget reflective of this time - that was necessary for the ongoing relationship building with data providers and advisory group members. Grantees also described how these relationships may need to be re-established during the project due to job changes or elections, as some coroner and law enforcement positions are elected officials.

"... a little more credence needs to have been given to the amount of staff and funding needed to build and maintain relationships with data sources. [The funding formula] is built on the number of dead bodies, not on the relationships needed to collect and analyze and disseminate that data."

CDC's budget estimates for gathering NVDRS data were based on the National Violent Injury Statistics System (NVISS), which was the pilot program for NVDRS.

Building and Managing an Advisory Group

Partnerships also are central to the advisory group, or groups, established to help guide a state's violent death reporting system. Grantees offered suggestions on the composition and focus of an advisory group and the frequency of its meetings.

Consider broad versus focused representation

Some grantees had broad representation from data providers, data users and prevention partners on their NVDRS advisory group, and found this approach allowed for ongoing interaction between data providers and end users. One large NVDRS state, however, reported that the sheer size of its state made it difficult to have representatives participate from across the state.

Other advisory groups included only data providers for the first year or two when the program focus was on data access and collection. As the focus shifted to data analysis and dissemination - and programs had actual data to share with the advisory groups - membership expanded to include end users of the data and other prevention partners at agency and community levels.

"We're moving from a data gathering mode and advisory committee that approves data collection and release policies to a more expansive group to help us figure out how to get the information out and how to make it as useful as possible."

"The first few years were focused on functionality and implementation. Our advisory committee started with a core group of grant partners and discussions about how to get data. But now we're moving towards meeting the specific needs of data users, bringing stakeholders onto the committee, publicizing it, and putting out reports that stakeholders want."

"When we first began, we had people we needed data from. Once we had a system for getting information and supplemental reports and producing data, then we needed people who could take the data and do something with policy and dissemination."

Including data providers also may help gain or smooth access to data.

"It's a way to get access to data. We got a police officer from [a major metropolitan] county onto our board. We drew him in, had him sit with scientists and health folks. It added legitimacy to what we're doing. It showed that the police were genuinely interested in issues that are not just law enforcement, and there were partners there that are useful to law enforcement."

"If you can find those advocates in data source communities, the people who the community respects, then the advisory committee can be an advocate for your project. It's great to have someone on the advisory committee make a call for me for support. If a coroner who supports the project writes an article for a newsletter, that's better than me, someone from the health department, demanding something."

Take existing advisory groups into account

Some grantees recommended reviewing the purpose and composition of an NVDRS advisory group in the context of existing violence prevention groups in the state.

"When you bring an advisory committee together, are you bringing it together because it's a requirement or because you have a purpose and a benefit for committee partners? It's worth examining why we are coming together, what questions are being asked and answered and what's really needed to get the work done."

It's worth examining why we are coming together, what questions are being asked and answered and what's really needed to get the work done."

One state built its NVDRS advisory group around an existing child fatality review team mandated by state statute. Key data providers and prevention partners already were members of this team.

Other states have worked with existing advisory groups to meet specific NVDRS program needs, such as reaching end users of NVDRS data and prevention partners.

"I set up what I call a [NVDRS] technical advisory group with the big data managers...but we really don't have data users or programmatic people. Everybody out there is overwhelmed, there's no need for it. We already have an injury surveillance workgroup, Safe Kids, and other advisory boards that focus on specific programmatic purposes, so I'm just retaining the original group of data managers. But when we send a report out, we go out and do presentations and everyone gets to see the data report."

Consider separate committees or subcommittees

Some grantees found that separate committees worked well. One state established both a general advisory group and a technical board with representatives from the key data sources only. The technical board focused on posing and responding to technical data and process questions from NVDRS staff. This was helpful to program staff and did not bog down the work of the general advisory group with highly specific data and technical questions. Once the NVDRS program and database was up and running effectively, the technical board was dissolved.

Another state had three advisory groups. A technical group with data source representatives provided guidance on data issues and had the opportunity to review data before it was released. A data users group with representatives from statewide agencies provided policy-level insight, disseminated data and other NVDRS program information to their audiences and stakeholders, and helped ensure that NVDRS reports and fact sheets used formats and language appropriate for the agencies' audiences. A third group reached out to numerous grassroots organizations and service agencies in a community with the state's highest level of homicides. This group included community members working on homicide and suicide prevention, local law enforcement, county health department staff, social workers, an injury prevention coalition, churches, and staff from local universities doing violence prevention research.

Fortuitously, this approach also led to an improved relationship with law enforcement.

"We gathered people working in the community, the police and law enforcement working on the streets and asked them to come in and look at our data and suggest what do we need specifically in our community [in response to the data]. The police chief assigned several police officers to work with us, and this helped get access to police departments throughout the state, so now we're working through the police chiefs association to give presentations. We worked through some initial resistance and now have almost all police and sheriffs departments sending us data."

Focused subcommittees also may emerge from an NVDRS advisory group. One state developed a working group on elder suicide prevention after analysis of NVDRS data identified this as a priority problem.

The police chief assigned several police officers to work with us, and this helped get access to police departments throughout the state, so now we're working through the police chiefs association to give presentations."

Consider media and academic institutions

An invitation to participate in an NVDRS advisory group can forge useful relationships with media outlets.

"[The reporter] likes to come to advisory committee meetings because it puts him in a room with the high ups in agencies like the police department. He builds his rolodex with people in the room that he needs to know and contact for other stories. He's out there, talking to other reporters in print and TV, and he's suggested other media contacts call me for stories [related to NVDRS]."

The benefits can be mutual. One grantee described the need for state violence prevention programs to work with prevention partners to include violence prevention and resource information in newspaper articles and other media stories about violent deaths.

"You'll see an article, it will tell a horrible story about family violence, and then there's nothing about what to do about it, so you're so upset that you've read or seen this. You just need two more lines to say that if you're upset, if you can identify with it, contact X, so it doesn't just end, leaving someone feeling helpless who's already feeling that way. We can work better with media."

Getting academic institutions and organizations involved can also strengthen the work of an advisory group. Consider medical and graduate students or staff from the nation's 12 injury control research centers, which conduct research in all three core phases of injury control - prevention, acute care, and rehabilitation - and serve as training and public information centers.

"Don't neglect an academic connection. It has brought us students from preventive medicine, from medical college, from an epidemiology graduate program. They need experience in working with data sets and doing fundamental epidemiologic work. I've tutored them in basic data reporting and how to use NVDRS. If you get them interested and involved, hopefully eventually they will want to use the data."

"We have a strong relationship with the university's injury prevention research center. We contract with them for two positions and a graduate assistant for additional epidemiology and evaluation expertise."

National associations such as the International Association of Chiefs of Police also may conduct research.

"Don't neglect an academic connection. It has brought us students from preventive medicine, from medical college, from an epidemiology graduate program. They need experience in working with data sets."

"For those getting started with NVDRS, if they can establish a relationship with law enforcement organizations that have research arms, they could be a great asset. They can run interference in gathering law enforcement data. If you get them interested in accessing this data, then they may take on your case."

Be prepared to balance suggestions with agency realities

Inherent in advisory group work is the need to balance - and respond to - the thoughtful suggestions from members with agency requirements or procedures.

"We have members that include data providers, potential data users, researchers, and other state programs (lots of substance abuse people). Members often have very good suggestions, but often the suggestions from outside agencies, advocates or researchers are difficult or impossible to implement given [our] agency restraints and resources. It's difficult to explain why we don't do certain things that seem like great ideas. . . . But if [an idea] is not feasible, it forces us to think about alternative ways to get to the same place."

How often should your group meet?

NVDRS grantees reported experimenting with the frequency of advisory group meetings to determine a meeting schedule that is most informative and effective for their state. One state reported that meeting annually did not allow for sufficient ongoing input from its advisory group, while another state found that an annual meeting did not overwhelm advisory group members and gave them a refreshing perspective of the project each year. Another state reported that it went from meeting quarterly to semi-annually to annually, in part because advisory group members had to drive long distances from around the state to attend.

The challenge of engaging advisory group members and the benefits of keeping in touch in between advisory group meetings also affected the frequency of advisory group meetings.

"We meet quarterly, but there have been times when I feel like things are going smoothly enough that I've cancelled some meetings. You have to have enough tasks to keep them engaged. We also ask people's advice ad hoc, right away, instead of waiting for a quarterly meeting. We talk more one-on-one, and that gets things done more quickly."

"We have special topic meetings. Participation can be increased if you present on a topic of interest, but alternatively, if the topic is not of interest, attendance will be poor. We also keep in touch with them through email and an email list serve, so when a problem does arise, we have a group of people interested in helping us solve issues."

"The data providers said they didn't want to meet again until we had preliminary data. We could contact them with problems, but they wanted us to wait until we had data to share. So we met once the first year, and once this year. Next year, with a full year's worth of data, we can provide reports and we'll meet more often. We let them guide that instead of us saying you have to meet."

Sharing Resources: A Proven Partnership Strategy

Whether building a new partnership, establishing an advisory group, collecting data from the field, or disseminating analyses, the creative sharing of resources has proven to be a practical, effective method for NVDRS grantees to gain cooperation and participation from key data sources and prevention partners, and to maximize the impact of a state's NVDRS program. These strategies include sharing data, supporting related systems, offering tangible incentives, sharing staff expertise, and providing monetary and/or in-kind support.

"As with other surveillance systems, regular contact with data providers, including them in decision making when possible and sharing information and resources is critical."

"[Advisory group] members need something value-added, something they find useful in exchange for participation."

"We try to think of ways to be useful to our data providers. A lot of what we needed for NVDRS was in the application process. . . . It wasn't collaborative. It was 'we need these things.' It was a fixed set of requirements. So then we said if you need anything else, we can try to provide it."

"As with other surveillance systems, regular contact with data providers, including them in decision making when possible and sharing information and resources is critical."

Share data

Providing data or data analyses were the most common ways NVDRS grantees reported sharing resources with advisory group members and other violence prevention partners. To facilitate this exchange, grantees emphasized the importance of communicating with the data sources and end users about the NVDRS' purpose, the data to be collected and the analyses that may be generated. Seeking ongoing input from data sources on their data needs also was recommended.

To the extent possible, grantees underscored the value of understanding and responding to the needs of data sources, the agencies and organizations represented on the advisory group and other end users of NVDRS data. Grantees have generated tailored data analyses and provided local level data not available through other state or federal surveillance systems. For example, one state produced special homicide analyses to tie in with the needs and activities of the state's child fatality review and other groups working in violence prevention. It also provided data to key data sources such as law enforcement and coroners, who in turn have shared it with their partners or media contacts.

Staff from another state's violent death reporting system ran analyses to respond to a medical examiner's request for feedback on the accuracy of medical examiner reports compared to police and crime laboratory reports. Another state helped law enforcement data sources that rely on paper records by pulling out desired variables from the state violent death reporting system and providing them in electronic format. Grantees from other states also found data sharing to be an effective tool to build and strengthen relationships.

"...people in state agencies, especially law enforcement, are just weary of data sharing. They say, 'Oh no, here comes another set of initials that we have to give our data to.' We try to give them ownership, ask them 'How do you want to see this? How can we publish the data in ways that would be helpful?' We can compile your stats if you don't, your burden of violent deaths, how many investigations you had to do, etcetera."

"It's all about relationships. The [city] police department was not anxious to respond. [State] is one of few states where drug overdose deaths are given undetermined as a cause of death, but with the data computerized as part of NVDRS, we were able to respond to [city] police department, and almost overnight, the police department gave us most of what we needed. And, they asked us to keep eye on heroin deaths or drug overdoses, to give them notice if we noticed any bump up in numbers. So, data helps us with relationships."

"We've focused our data dissemination efforts more strongly on prevention. We are looking to strategically partner with other programs to help them with their program activities, not just by providing a stock report, but by having our data integrated with their activities. For example, we provide the domestic violence fatality review board with a listing of incidents that they use to decide what to review."

Some states have developed modules within the NVDRS to track data needed by their program stakeholders. One state developed two state modules - one on domestic violence-related deaths and on older adult suicide - using their own definitions and variables.

"We have got to do a better job of acknowledging our data providers if anything is published. If they feel you're just taking their stuff and using it for your own purposes and running with it, that hurts the relationship."

Sharing data also can be an effective method for continually improving the quality of the state's violent death system. Particularly in states where requisite data does not come from a central state system, reports produced from the state violent death reporting system can illustrate what data is still needed (e.g. when a county coroner/medical examiner or police department has not yet provided data).

"What we've developed since beginning the grant are relationships to make people aware of what data we have. We can share that, and help break down barriers. It's easier when we walk into [a data source's] office with a report and we can show what we have, and what we're missing."

Finally, when sharing or publishing data, acknowledgement of the data sources is important.

"We have got to do a better job of acknowledging our data providers if anything is published. A year ago, something came out and one of the coroners was really upset because it didn't acknowledge them. If they feel you're just taking their stuff and using it for your own purposes and running with it, that hurts the relationship... we're working really hard at changing that."

Support-related systems

NVDRS grantees also have found creative ways to support the system needs of data providers, advisory group members and other prevention partners. By strengthening these systems, they may in turn strengthen the state's violent death reporting system.

For example, one state provides relevant NVDRS data to the state's child fatality review team, saving the review team the time and expense of gathering the same data for its retrospective case files. It also collaborates with the state board charged with determining the minimal training needed for new coroners to include information about the NVDRS into the coroners' training; and, it is helping to establish a web-based coroners reporting system.

Another state has paired its NVDRS carryover money with bioterrorism and emerging infectious disease money to help fund the development of electronic data sets for the state medical examiner's office. Carryover money was used to purchase items such as a server, updated software and programming time. This improved system allowed the state's NVDRS program to log on to the medical examiner's data set to get NVDRS case data and most variables that it needed. Hard copies are only needed about once a month to gather the remaining variables.

"These are one time, one shot deals that really improve the system.... It benefits all public health programs. About five years down the line, we'll have an electronic data system where the medical examiners can enter data directly in the system and we can pull it out directly."

System improvements may even occur during the NVDRS cooperative agreement period. In one state, the diligent work of the state's injury and violence prevention program led to improved data collection.

"The medical examiner's office got some extra funding and developed a surveillance system. It was a way to provide us with medical examiner reports electronically so we don't have to do abstraction in their offices for most part. They saw a need because we were up there so much. It has developed into a good partnership."

"The medical examiner's office got some extra funding and developed a surveillance system. It was a way to provide us with medical examiner reports electronically so we don't have to do abstraction in their offices for most part."

Offer tangible incentives

Tangible incentives also have worked well to build relationships and facilitate data collection from the field.

One state gave laptops to coroners from the top four counties reporting to the state's violent death reporting system. It also developed brief guide books for coroners to take to an investigation scene with information about how to collect the requisite NVDRS data; the book includes a standard form for recording these data and faxing it to the NVDRS program. For coroners who don't report electronically, the state program also offers for free a \$30 software program called OmniForm. Instead of digging through their paper copies of incident reports, coroners can enter their cases into a database, search the database by key variables needed for NVDRS reporting and then email or fax this information to the state violent death reporting system program.

Another state has worked with its state coroners' association to offer unique incentives for improving access to and the quality of coroner reports.

"Other states may have a centralized system, and they may not need to do what we're doing. But NVDRS is only as good as the data we can get. One year we worked with the association to do mini-grants that county coroners applied for. Some needed a digital camera to take pictures of a scene. Most dealt with materials needed to do an investigation. Some needed training. The coroners from those sites were willing to participate in NVDRS."

The state coroner's association also helped this state's NVDRS program to plan and sponsor an annual state violent death reporting system data dissemination meeting. This collaboration has helped the coroner's association to strengthen its standing with its members and offer additional member benefits.

Training also is a desirable incentive. One state reported that it has supported training for local medical examiners and worked with the state association of chiefs of police to do a web-based series of lessons focusing on NVDRS as a tool for death investigation. This distance learning helped meet two needs of the state's law enforcement: annual continuing education credits and reduced travel costs.

Share staff expertise

The expertise and experience of state NVDRS program staff also can be a valuable resource to its data sources, end users and prevention partners. For example, staff members in one state shared their lessons learned from the NVDRS with those working to establish a state trauma registry.

"Given our infrastructure and how things overlap, we've been able to share what we've learned so they don't have to go through the same thing."

NVDRS program staff in another state offered epidemiologic and programmatic expertise to put NVDRS data into context. In response to a request from a county police officer working with a family whose son died from a drug overdose, the NVDRS program's principal investigator produced a mini-report for the county on all suicides by drug overdose compared to those that were ruled undetermined; the analysis showed no statistical difference between the two groups.

"The police officer said that [the data] would help in talking with the family, because families don't realize that it's happening to other people, that it's not exclusive to them... He's used that [data] for family counseling. That's a police officer who knows we'll help him to do his job. It's also helping families understand more about a cause of death. That's what we're after - tools to help people do their job."

Provide monetary support

Not surprisingly, providing funding to NVDRS data sources can encourage participation. However, the amount may not be as important as the goodwill that this offer engenders.

"The amount of funding shared can often be quite modest - it seems to be the symbolism of sharing that is important."

"As we discovered with earlier surveillance projects, the ability to share resources (particularly money) with partners is extremely helpful. The amount of funding shared can often be quite modest - it seems to be the symbolism of sharing that is important. One important consideration is that giving data providers a small amount of funding, with very few 'strings' attached can be more useful than 'big bucks' with lots of strings."

In other cases, limited funding for data sources may be a barrier.

"When we informed them of our funding level, they were disappointed and seemed to lose their motivation to some extent. Instead of hiring county personnel, we contracted to reimburse them \$105 for each reported case. We thought this was an adequate amount to motivate them but it was very difficult to get cooperation, partly because no staff was exclusively devoted to this project and partly because they were drained by the efforts they put into resolving all our technical issues without pay. Additionally, we did not have any funds to directly pay data providers so the cooperation there was lacking as well."

Offer in-kind support

In-kind support to data sources has proven helpful in some instances where direct funding is not possible or may not be an effective method to encourage participation.

"...we have been willing to drive to all [data source] locations. I don't think money would change any of the individuals who have refused to participate. We are thinking of reaching out to the county medical examiners - that's an example of an opportunity where sharing resources might help. But money won't help someone worried about confidentiality."

"We do not have a formal agreement to share resources with the sheriff's association, but they have a place on the advisory council and we provide continuing education credits at our data dissemination meeting."

GETTING STARTED

Grantees spent the majority of the cooperative agreement's first fiscal year - and in some cases the second year as well - setting up the basic infrastructure needed for the NVDRS. This process included getting existing staff in place, hiring new staff, training staff (e.g. CDC's NVDRS coding training), purchasing equipment (e.g. computers, servers), installing NVDRS software, building a strong working relationship with IT departments and staff, establishing data collection and data entry procedures, working with data sources to access data, initiating data abstraction if possible, developing a secure process to regularly transfer data to CDC's NVDRS contractor, establishing a program advisory group, and setting up fiscal accounts and/or contracts for the cooperative agreement. As one grantee stated:

"There are three things needed for program operation and to meet the contract to feed information to CDC: you need the data suppliers on board, abstractors with brains and enthusiasm, and an IT department willing to be patient and work hard to get it set up right."

Grantees also spent much of the program's first fiscal year navigating the inevitable obstacles that occur during a program's set-up phase. Some of these obstacles were experienced by multiple states; others were primarily reflective of state-specific situations and bureaucracies, but all provide insight into the challenges that states may face in establishing a new surveillance system. Information on states' creative responses to these challenges also is provided.

Three program set-up activities were frequently cited by grantees as taking longer than anticipated: hiring staff, installing NVDRS software and addressing IT problems. Each of these activities is addressed in detail in other sections of this report, including Staffing on page 25, IT and Computer Support on page 33, Data Management on page 38, and Data Analysis on page 49.

Grantees drew upon their experiences to provide numerous suggestions for setting up a state violent death reporting system.

"There are three things needed for program operation and to meet the contract to feed information to CDC: you need the data suppliers on board, abstractors with brains and enthusiasm, and an IT department willing to be patient and work hard to get it set up right."

Work out program details

Although grantees addressed many of these infrastructure-building activities in their NVDRS applications, once funded, they developed the activities in greater detail. For example, program staff members in one state estimate that they spent about 70 percent of the program's first year establishing and trying out protocols for case ascertainment, data collection, data entry, data re-abstraction, and other quality checks.

Other grantees discussed the diversity of activities and problem-solving efforts needed to set up a state's violent death reporting system.

"For the first year and then some - the first 18 months - were very focused on software issues, getting the fine details of what data would be provided, what the process would be. We were entangled in administrative and program management details. We had to write interagency agreements to transfer money, we were getting positions posted, etcetera. A lot of the first year was spent on getting things in place."

"During the first year, obtaining data from death certificates, the office of the state medical examiner and supplemental homicide reports from the state police were not problematic, but we underestimated the amount of data required from law enforcement and a great deal of time in year one and year two was spent trying to resolve that issue."

"The first two years of the project were spent on setting up the system; training abstractors; soliciting approval of the project from [the state IT department] and, upon disapproval, working with our local IT folks to figure out how to accomplish the goals of the project without [the state IT department] support or scrutiny; waiting nine months for laptop computers to arrive; addressing data concerns with data providers using our legal counsel and department of justice contacts; installing, re-installing, and upgrading software for laptop and desktop computers; mailing laptop computers back and forth to and from counties to troubleshoot password issues, update encryption software, perform security software updates, and troubleshoot NVDRS software; and, figuring out how best to get data to the state given all the previously mentioned problems."

"There were a lot of initial coding questions. Every day we'd come up with a new question. We had lot of conference calls with CDC and submitted questions to the help line."

"During the first year, we worked through all the bugs in the software and the system. There were a lot of initial coding questions. Every day we'd come up with a new question. The NVDRS coding manual was very thorough, but inevitably things would come up that weren't covered, so we had lot of conference calls with CDC and submitted questions to the help line."

Make use of down-time

Also inherent in establishing a program is the down-time that occurs while waiting for equipment to arrive, software to be installed or staff to be hired. Grantees recommended preparing for and making effective use of any lull in activity. Grantees

"A large portion of the first year's field work was done on paper. Once the computer system became operational, all the paperwork had to be brought into the electronic system."

from two states recommended using this downtime to develop program manuals and procedures for tasks such as re-abstraction and surveillance system evaluation. While a state's NVDRS database and software are being set up, several grantees found it important to begin collecting hard copies of the requisite data and finding ways to jump-start the overall data collection process.

"In the first year, we didn't get the data software until June, so we were sending staff out to abstract data onto paper copies for what we thought the data system would have for variables... we had no idea what the variables would be, so we were collecting data onto paper forms and holding them so later we could enter them into the software."

"A large portion of the first year's field work was done on paper. Once the computer system became operational, all the paperwork had to be brought into the electronic system."

"The office of the medical investigator was willing to make a staff member available before the contract was signed, so she started setting up internal file management even before we had the [CDC coding] training... because that staff person had prepared the files and flagged cases from the beginning of the first data year, we got up and running immediately."

Seek input from program advisory group

During program set-up, the state's NVDRS advisory group (with representation from the requisite data sources, at minimum) can be helpful in advising on the implementation of the new surveillance system's goals and objectives.

"We established a data quality committee to advise us on questions such as 'Do we have systematically missing values on a record? Are there fields that are never filled out? Are we having trouble getting reports? Are the reports complete?'"

Attend CDC NVDRS coding training

CDC requires all new grantees to attend its NVDRS coding training before entering data into the system. Grantees reported that the training provided program staff with information to orient them to the specifics of NVDRS data collection and abstraction, gain familiarity with the software provided by CDC and begin building a common understanding of NVDRS protocols.

"CDC had done a coding training in January 2004 and we got familiar with the software, so we were primed to go when CDC came out and installed the software."

"The advantage of the CDC training is that you get CDC's message packaged the way they want you to hear it. For a project with this level of complexity, it's not hard for people to get their own read, their own take on this, and the training gets people on the same page. You can get the training later and readjust, but there is an advantage to doing the training first."

"The earlier your staff can have formal training the better. The training needs to occur to some degree as or before you approach the data agencies, so you can better present what you're trying to get. At the beginning, we felt like we were asking for things but not sure exactly what we needed since we hadn't really worked with software yet. You have a coding manual, but until you've worked with all the variables or had the training session and gone through it, you don't understand the issues of converting data coded by one agency into what you need."

STAFFING

Addressing a state's staffing needs for the NVDRS was an ongoing, changing and often challenging aspect of establishing and managing a state's violent death reporting system, according to grantees. Issues directly or indirectly related to staffing affected most facets of a state violent death reporting system program, from data collection and analysis to adequate IT support and the skills needed to build relationships with requisite data sources and other advisory group members, violence prevention partners and end users of NVDRS data.

Some guidance in staffing a state's violent death reporting system program is reflected in the cooperative agreement's RFP requirements. And, while grantees reported some common lessons learned and recommendations, they also reported that the process for finding an effective mix of staff members with the combined skills sets necessary to develop, implement and evaluate a state violent death reporting system was very state-specific, reflected the state's specific needs and challenges, and involved a good amount of trial and error.

Grantees pointed to several factors that might influence the ability of state programs to hire and retain an effective mix of staff for the NVDRS cooperative agreement, including:

- the relevant skills, experience, and existing relationships (e.g. with data sources) of existing staff members who will contribute some or all of their time to the program and new staff members to be hired (or contracted);
- resources, including the amount of additional funding or in-kind staff support provided by the state health department beyond that provided in the cooperative agreement; and,
- staff turnover and a readjustment of staffing composition or responsibilities as the skills and experience needed in a state to get the work done are clarified (e.g. once data collection and other program implementation activities begin).

Each of the above factors is discussed in detail below. Other staffing topics addressed in this section are:

- the role of a program's principal investigator;
- the hiring process within a state bureaucracy;
- the myriad of factors to consider in hiring and retaining effective data abstractors; and,
- the importance of taking staff's mental health into account.

Essential Staff Skills

Finding staff with the right mix of skills and experience for the NVDRS can be challenging. As one grantee stated:

"It's been very difficult to attract the type of people you need to work with this data and software. It's hard to get all the skills in just a few people... we haven't been able to find someone to do relationship building and programming and science."

But among the myriad of skills that collectively may exist among the staff members of a state's violent death reporting system program, grantees frequently touched on three areas that they considered essential: building and maintaining relationships, working with data, and having IT expertise. Grantees described how staff's competence in these skill areas affected the NVDRS program in their states.

Building and maintaining relationships

The development and maintenance of relationships needed for the NVDRS - such as those with the requisite data sources - is described in detail in the Partnership Development and Maintenance section of this report, beginning on page 11. The importance of this skill is underscored in the following experiences of grantees.

"A lot of it is based on who these people are and their past relationships. If [staff member] left, I'd be in a bind unless I found another person with law enforcement contacts because they may not respond to me. But I interact with coroners and we have a strong relationship. You have to find the right mix of folks to do the work and you need to speak their language."

"I was a one-person shop, so my biggest problem in the first year was staffing. I had administrative responsibilities and had to stay in the office, so I hired someone to go get the data and she ruined the relationships [with data sources]. So I hired a coroner, but he didn't have good relationships with everyone. So the person who goes to get the grant, does the PR work to get it - that PR element needs to be consistent. I'm spending the summer traveling all over the state to build and maintain the relationships... consistency is so important. Here, coroners won't schedule appointments with someone they don't know."

"I'm spending the summer traveling all over the state to build and maintain relationships. Consistency is so important."

Working with data

Skills related to working data are needed throughout the entire program timeline, from data abstraction and entry into the program database, to data cleaning, analysis and dissemination, to evaluation of the data and the entire surveillance system. Some states also found it important to have a person dedicated to managing the data collection process.

"Now we hire people who can read something and understand it and recapitulate it without embellishment and imagining. You have to be faithful to a record. You need a person good at data entry, who is patient and timely. The NVDRS software asks you to put in exactly the same data elements over and over."

"You need someone who has data entry savvy and understands the software program... the size of the NVDRS file is huge and with so many variables, it takes a while to learn and become fluent with the system."

"A number of skills are required. You need staff who can convert a relational database into flat files for analysis, run code within the system; make decisions about [data source] primacy. And, putting the code into SAS requires more than an intermediate level of programming ability. The data set is very complicated to work with."

"We have one full-time person in the office... Tracking the data needed, requested, received, and entered is critical to timely and complete data entry."

Several grantees recommended that all staff members should do some data abstraction, regardless of their primary duties within the NVDRS program. One program manager said that he and the program's epidemiologist abstract several data records on a periodic basis because "it keeps us from getting too far away from the project." Another grantee described how abstracting data improves knowledge and understanding that are relevant to data analysis and surveillance system evaluation.

"[Data abstraction] is absolutely essential to understanding the project. If you haven't spent time with the data, I worry about how accurately you can present the data later on. You have to look at the data source, understand what's being taken out of it, and what's left, what's not being accounted for in the software. Granted, we can use narratives, but not everyone is reading all of those. If you're abstracting, you learn very quickly which agencies are giving you the best data... if you're not working with the data, you may make sweeping conclusions about the quality of the data sources."

IT expertise

The need to have direct or in-kind IT expertise was discussed at length by grantees, and is presented in detail on page 33 of this report.

Role of the Principal Investigator

The way states approached the role of the program's principal investigator (PI) also varied. Some PIs devoted a relatively small portion of time to the NVDRS program while others have found it necessary to give the program much or most of their time. This variation was influenced to a degree by the resources available to hire other staff, the number and responsibilities of other program staff, and the extent to which the requisite data sources are centralized and/or submitted electronically.

"There's the question of whether or not I should be chasing data. I have a data manager/coder who tracks data and helps in the office when I'm gone. About seventy percent of coroner data comes through the mail, email or fax, so I'm going out to get the other thirty percent."

"For myself, I wanted to be intimately involved as PI, not play a minimal role with a program manager who runs everything. I've been comfortable with it being a focus of a lot of my work."

"As the PI, I started out part-time. That worked well for establishing the program, but for data analysis, the PI - myself - needs to take a more in-depth role with the analyses, reviewing the quality assurance process, writing reports, etcetera."

"As PI, I make sure planning is done, that we have a mechanism for disseminating data as it comes in, doing liaison work with data sources in the community, making sure advisory committee members are participating to their maximum capacity, being the spokesperson for the program, doing presentations or lectures, talking with the media, writing the grant, doing budgets, writing papers - higher level administrative stuff."

"There's the question of whether or not I should be chasing data. I have a data manager/coder who tracks data and helps in the office when I'm gone. About seventy percent of coroner data comes through the mail, email or fax, so I'm going out to get the other thirty percent."

Hiring Within a State Bureaucracy

Not surprisingly, the process of hiring employees to work at a state health department or other state agency may include a variety of bureaucratic challenges. These challenges typically are due to the unique workings of state agencies, rather than specific requirements of the NVDRS, but they are nonetheless a reality of staffing and managing a state's violent death reporting system.

Several grantees found that the hiring process took longer than expected. As with other cooperative agreements, the process of writing, getting approval for and posting job descriptions through the state agency's human resources department can take months. One grantee expedited this process by working with the state's human resources department to get the bulk of this work done while waiting to hear from CDC if the state would receive funding for the NVDRS.

Program Resources

Resource challenges

Several grantees said they would have preferred to hire staff for some positions (e.g. abstractors) as full-time state employees but resources were not sufficient to pay for the required benefits. Instead, they hired part-time staff or contractors with no benefits. (For more information on funding and resources for abstractors, see the Abstractors section on page 30.) Others addressed the challenge of balancing budget realities with staff retention.

"Staffing numbers have been reasonably sufficient and appropriate, but the budget for the project can make staff retention an issue. We've had significant turnover in staff, where salary was a partial issue."

Given these lessons learned, states should think strategically about where the bulk of salary dollars are allocated within the state's NVDRS budget.

In-kind resources

In-kind resources from within state health departments or other NVDRS partner agencies enhanced state NVDRS programs in multiple areas - from staffing to data collection to IT support. Here are some examples of grantees' creativity in finding these resources.

"For the first three months, we spent a lot of time of trying to understand the coroners' reports. The person who abstract coroners' data was in the same unit as the records for TBI surveillance, and she has a ready reference to the medical records coder who is familiar with terms. We try to have resources within our entire section who can provide advice."

"We underestimated the amount of IT support required. We've been lucky that we can utilize the services of the IT person who actually works in another program. It's an in-kind contribution from another department. It's not his primary responsibility, so we have to maintain good relationships."

"We have a student working to transfer data into the medical examiner's electronic system. She doesn't belong to us, but she's helping us. I try to draw upon the skills of others around me."

Grantees also recommended thinking strategically about in-kind resources. In-kind support may be a necessary - but not a preferable - strategy for bringing together the skills and expertise needed to develop and maintain a complex state violent death reporting system. When state and local injury and violence prevention resources are scarce, finding sufficient in-kind resources to fully develop and maintain a state violent death reporting system can be challenging. This may be particularly true when in-kind contributions are needed on an on-going, rather than a temporary, basis.

"Our injury surveillance program is funded by federal grant money, so we have no support for NVDRS from department, so it has to fit within the NVDRS budget. That may not be true for other states that can access direct or in-kind support."

Staff Turnover and Adjustments

Grantees reported that staff turnover in a surveillance system as complex as the NVDRS can be particularly challenging. They commented on the time it takes for staff to build and maintain relationships with data sources or the significant learning curve needed to become proficient in abstracting NVDRS data or using the system's relational database. A team approach was recommended.

"When staff change, there's such a huge learning curve. It's hard to develop that complete picture of how everything works and fits together. You need to keep everything team oriented. If only one person knows how to do something, you can't support each other, and then if someone leaves, it's really challenging."

Staffing adjustments due to factors other than turnover were common as state violent death reporting system programs were established and began collecting and entering data. Although the exact fine-tuning needed was specific to each state's situation, examples from grantees illustrate how programs arrived at effective staffing solutions.

A principal investigator in one state found that in order to adequately manage data sources, advisory group members and program meetings, she had to give up coordinating the collection of coroners' data and hire a part-time staff member to abstract these data (another abstractor was already in place to collect law enforcement data). Other state violent death reporting system programs added a temporary part- or full-time abstractor to their staff to respond to an influx of data as program participation from data sources increased or if data had accumulated during initial program set-up. One grantee described the need for more administrative support than originally anticipated.

"In the first year, because so much of our stuff was on paper, we learned that we need more administrative support than I thought. And in the second year, because we were working on 2004 and 2005 cases, it became a cumulative situation, so the reality was that instead of 1,200 cases, you have 2,400 cases, and there's the ongoing need to be tracking paperwork. A full time administrative person in the first couple of years is important, unless you're doing everything electronically."

One state violent death reporting system program originally hired a full-time computer programmer, but the state IT department would not allow anyone outside of that department to do the necessary NVDRS work; likewise, part-time staff hired through a staffing company to do data abstraction did not work out.

One state violent death reporting system program originally hired a full-time computer programmer, but the state IT department would not allow anyone outside of that department to do the necessary NVDRS work; likewise, part-time staff hired through a staffing company to do data abstraction did not work out. The principal investigator then readjusted her approach by working through the state IT department, hiring a daily program manager without a high level of IT expertise, and hiring and training two abstractors.

A final example illustrates how a program manager adjusted program staffing as she learned to match staff personality with program needs, such as data abstraction.

"When we first started the project, I hired retired law enforcement and death investigator kinds of people into our surveillance coordinator positions. The coordinators are paper people, reading death records and putting them into [the NVDRS] database. I thought 'these are the folks who are knowledgeable,' but death investigators and police folks, they're adrenaline folks. They like the activity and action associated with a death investigation. So in the early years of the project, I had lots of turnover. I retained one law enforcement officer who was retired and ready to sit at a desk and give up the other life."

Abstractors

In general, grantees reported that the abstraction process is affected by the degree to which the requisite data sources are centralized (i.e. collected entirely or primarily through a state medical examiner's office instead of through individual county examiners), can be electronically submitted to the NVDRS program or can be imported using the NVDRS software (CDC has worked to improve the importation function of the NVDRS software). As one grantee said:

"Since we've been funded, the importation function for death certificates and coroner reports has been developed, but abstracting is still the standard of practice for police reports and crime lab reports."

Even if a data source is centralized, available electronically and can be imported into the NVDRS, grantees reported that data abstractors are one of the most important pieces of the NVDRS staffing equation. Grantees shared lessons learned about qualities to consider in an abstractor, how the abstractors function within the NVDRS program and ideas for dealing with turnover.

Abstractor qualities, skills

Grantees offered insight into what makes for effective NVDRS data abstractors. Based on her experience with a traumatic brain injury surveillance system and the NVDRS, one principal investigator recommended using Registered Health Information Technicians (RHITs), health information technicians who are trained to ensure the quality of medical records by verifying their completeness, accuracy, and proper entry into computer systems. Several grantees pointed to the need to find critical thinkers who have mastered attention to detail, can handle repetition and can function in a sometimes rudimentary work environment.

"You can have me [program manager] and an epidemiologist, but if you don't have a good abstractor team, you're in trouble. You need bright people, critical thinkers who can really think about files, and you have to get them on board and trained in a hurry."

"There's a misconception that abstraction could be done by a clerical person. It really requires thinking about public health... it's not just going through a sheet and checking off boxes, and that has funding implications."

"The abstractor we have now - our second - was in the court system and had experience with legal language... The first person was not in this area, and she lacked attention to detail, which was essential to have."

"Abstractors have to be sensitive to the source of the data and how sources find their data and the vocabulary of the data. Abstractors are the most important piece of the whole project."

"Abstractors have to be sensitive to the source of the data and how sources find their data and the vocabulary of the data. Abstractors are the most important piece of the whole project."

"[The TV program] CSI is glamorous, but people don't realize they'll be sitting behind a desk in rural [state] getting data."

Resources for abstractors

Allotting sufficient resources to hire and retain such individuals should also be taken into consideration.

"The abstraction is the heart, soul and guts of the project, and the data we get out of it is only as good as what goes in. We've found that about \$15 per hour for abstraction only buys you turn over and compromises the quality of the data. No one wants to be a coder forever, but turnover would be alleviated with more realistic expectations of what's needed to buy good coders, and simplifying the process for abstraction."

"When we were conceiving our staffing levels, there may have been an underestimate of how much abstraction was needed. We need to pay people enough so we don't have a revolving door. So we're struggling with how to meet our budget, cutting peoples' hours here and there to make up deficits. A file that only takes a half hour is few and far between. It usually takes more. Plus there's travel time to and from [site], so if you're doing six or seven cases, even if you're just in one office, it's a huge complication in terms of the amount of time spent to get data and get it into our system."

How abstractors function

Grantees offered ideas on how an abstractor, or a team of abstractors, can effectively function within a state's violent death reporting system program. Overall, a team approach and cross-training was highly recommended. In some states, abstractors needed to travel, while in others they typically did not.

For example, a team of abstractors of 2.5 FTEs in one state worked independently some of the time, but would go together to abstract from a large metropolitan medical examiner's office when a number of cases equivalent to a full day of abstracting had accumulated. The program manager described the benefits of this process.

"They can bounce questions off each other first, and if they need a tie breaker, I tell them to come back to the office and we'll talk about it."

"The abstraction is the heart, soul and guts of the project, and the data we get out of it is only as good as what goes in."

In another state, one abstractor was stationed at the state health department to handle the state coroner data that are mailed directly to the department, while another abstractor traveled to various law enforcement agencies and used a laptop to abstract records into the NVDRS software. This second abstractor was paid per record at a rate that included the cost of travel. Some states, however, found that participation from a major law enforcement agency such as the state bureau of investigation was contingent upon the state NVDRS program paying for abstraction to be done onsite, either by current bureau staff or an approved contractor.

Travel considerations

The need for abstractors to travel varied among states, depending on the degree to which the data sources were centralized and whether the data were submitted electronically, by U.S. mail or by fax. In some states, abstractors traveled primarily to resolve an issue or get data from a local data source that preferred - or whose resources dictated - that the data be collected on-site. One grantee explained why it was important for the state program's abstractor to travel.

"We have one abstractor. Our state is not geographically large. The comfort level of most of our law enforcement sources dictated that at least in the beginning, we travel there. Especially because copying records and sending them would have taken their staff time and unless we were willing to offer compensation, that could have limited participation."

Abstractor turnover, cross-training

As noted above, grantees found that program resources can be a factor in hiring and retaining quality abstractors. State violent death reporting system programs typically tried to retain consistent staff among their abstracting teams, but at least one state found that it was effective to use a rotating group of part-time abstractors in order to circumvent the long state hiring process.

"You really want to think in terms of having a group to do abstractions, trained to a point to handle the data. We have incorporated the use of lower level staff to perform data entry and abstraction, and retrieval and copying of death certificates and news articles under supervision."

"Our initial abstractors were hired away and we had to replace them and we had to recover from that. You want to have some critical mass of abstractors, two or more. It took us another six months to get another abstractor up to snuff, and now we're playing catch-up."

"Our abstractors are largely students at [local university]. They are part-time and they turnover when they finish their degree. So we always have a rotating group of three to four abstractors. We've found that it's easier to hire two to three part-timers who turn over frequently than to hire permanent staff. We've had really good abstractors by hiring students. One did her thesis on it."

To prepare for potential turnover among abstractor staff, grantees recommended cross-training staff within and outside of the state violent death reporting system program.

"You really want to think in terms of having a group to do abstractions, trained to a point to handle the data. We have incorporated the use of lower level staff to perform data entry and abstraction, and retrieval and copying of death certificates and news articles under supervision."

"Additional abstractors are being cross-trained in coding to assist in re-abstraction of records and to ensure continued functionality of the program in the event of staff turnover. We have started some cross-training of other staff in areas such as traumatic brain injury to help with abstracting and re-abstractions."

"We had the forethought to have everyone cross trained so we had backup when needed, otherwise we'd have been in trouble when an abstractor didn't return from maternity leave. The traumatic brain injury staff person was able to keep it going until I could hire someone else. You can't hire someone straight off the street to do this work."

Consider Staff Members' Mental Health

Given the violent, graphic and often tragic nature of the cases that are part of a state violent death reporting system, grantees emphasized the importance of staying attuned to the mental health needs of staff members. Working as a team, maintaining good communication, having diverse program responsibilities, and checking in with staff members individually or during staff meetings were recommended. One state program had a psychologist with experience in critical incident debriefing meet with its staff members.

"Within the state, NVDRS has to be managed as a team, for the health of people working on the project, and for the quality of data to come out of it."

"You're working on a subject matter that is very dark and difficult, so the atmosphere must be very light with good communication. If someone is having a bad day, maybe they don't need to abstract that day. If [abstractors] come across a case that upsets them, I want them to know that they can talk to me. When we have meetings, I ask if there are any cases that staff just need to talk about."

Dedicated IT program staff

In this approach, a dedicated IT staff member(s) provides direct, in-kind assistance to the state violent death reporting system program and is located within the injury and/or violence prevention program or within another unit or division hierarchically close to the program. Many grantees expressed a desire for dedicated, accessible and responsive IT support for a state's violent death reporting system program, but due to resources and organizational structure, it often did not occur.

"We could use our own full time IT person - a knowledgeable, experienced person. We tried to get sophisticated IT folks, but the state won't pay for it. We can't get people we need at the salary the state will pay."

"When we applied for the grant, our bureau had IT people that provided IT service just to us, but then IT functions were centralized. We underestimated the amount of IT support required. We've been lucky that we can utilize the services of the IT person who actually works in another program."

It is worth noting that in one state, hiring dedicated IT staff for the NVDRS did not mesh with the state system. The state's violent death reporting system program hired a computer programmer, but then learned that the IT division of the state health department would only allow its staff to complete the necessary work.

"...so all the set-up for NVDRS had to be done through the IT section. It was the only way we could do it, and six months later, the computer programmer was bored and found another job that was more interesting and paid more money."

"IT was involved in the original NVDRS application to make sure we could set up our system to meet the grant requirements. They have to be involved when we download or update software. We can't just download anything onto our computers."

Separate IT division ("ticket" system)

More common among states was the use of a separate IT division - within the state health department or through a state's separate IT agency - to provide assistance based on a "ticket" system that requires staff members to make a formal request and wait for assistance. Though assistance typically was in-kind, some grantees reported that some amount of payment was required. Although they managed to work within this system, several grantees expressed frustration with this approach.

"We have a ticket system, we wait in line. That kind of tech support doesn't cut it for such a complex system."

Contract or other formal agreement

Some state violent death reporting system programs established a contractual or other kind of formal agreement with IT and/or computer programming staff to provide direct support, often at a cost, to the program. One state took this approach from the start.

"IT was involved in the original [NVDRS] application to make sure we could set up our system to meet the grant requirements. They have to be involved when we download or update software. We can't just download anything onto our computers. We have a good working relationship with them. We wrote in some funding for them as well to assist us."

Likewise, another program got the IT support it needed by paying about two percent of the salary of an IT staff member in a larger division of the state health department. In another state, the state violent death reporting system is operated in partnership with the state university. IT support at the state health department was used for initial program set up, but the state health department contracted with the university to house the NVDRS server, provide data storage and provide IT support. The IT staff members at the state health department and the university have an ongoing relationship and can contact each other directly. According to the grantee, this arrangement is preferable because the university pays better than the state health department, retains its IT staff and designates a staff member to assist the state violent death reporting system program. In contrast, the program has no dedicated IT person at the state health department, where a "ticket" system is used.

In-kind exchange

This approach exemplifies how grantees have implemented creative and resourceful problem-solving. IT support is provided to the state violent death reporting system program in return for other kinds of assistance from the state injury and/or violence prevention program. For example, the state violent death reporting system program in one state health department did not include IT support funds in its budget, but instead funded staff in the state medical examiner's office to do some of the NVDRS work. In exchange for this staff support, the IT staff at the medical examiner's office supported the needs of the state violent death reporting system program, including managing the program's server and desktop computers, conducting the CDC software updates, transferring data, and in general keeping the program running. In another state, the NVDRS program manager negotiated a mutually beneficial exchange.

"We worked out an in-kind agreement... I offered my analytical skills, and by my helping with the child fatality review team, it's a wash. They support our IT needs. It's not a long-term solution... but it's working for now."

IT staff should be able to install, maintain and trouble-shoot the NVDRS program's server and computers, and be proficient in using a relational database management system such as Microsoft's SQL Server.

Regardless of the system or approach used, experiences of grantees indicate that their influence on the level, quality and responsiveness of IT support is limited. Relationship-building, paying for services or offering an in-kind exchange of services may help. A realistic assessment of - and communication about - the IT and computer programming support needed is recommended. Although they were not asked to quantify the amount of IT and/or computer program assistance needed, several grantees stated that it was more than they anticipated, particularly during the program's set-up phase.

"It went okay because we have our own IT person... I was under impression that there was little that we'd have to do with regard to IT in our own states... it took a lot of the IT person's time, and he's not someone who we'd asked for his time. He works with 100 people. It was a strain getting that started."

"We have an IT person within the division who helps with software upgrades and technology issues... The first couple of years required much more assistance from IT with software and hardware problems or issues. A lot of demands were put on IT which was problematic. [Now] we use someone from another program for issues that come up."

Skills of IT and computer programming staff

Whether the necessary IT and computer programming skills are found spread among several staff members (within the injury and/or violence prevention program, the state health department or another state agency), or whether they come bundled within a single staff person, grantees outlined some of the staff skills and qualities they found to be essential for installing, managing and generating data from the NVDRS.

Computer hardware

IT staff should be able to install, maintain and trouble-shoot the NVDRS program's server and computers (desktops and/or laptops), and be proficient in using a relational database management system such as Microsoft's SQL Server.

Computer software

IT staff should be able to install and troubleshoot the NVDRS software, security software and encryption software provided by CDC and/or by the state health department. Although CDC provides states direct assistance from its contractor for installation of the NVDRS software, it is helpful to have someone at the state skilled in this area. Installation of regular software upgrades from CDC also is required.

Programming

Programming skills are needed not only for setting up the NVDRS server and database, but also for extracting data from the server and database and analyzing the data in SAS or other analytic software. For example, a state NVDRS program manager worked with a programmer to set up an Access front end for importing real-time SQL data into Access tables, and then write queries for quality assurance and basic analysis. Another programmer worked with the program's epidemiologist (the primary data analyst for the state's violent death reporting system) to write queries to create specific, more complex analytic files that are analyzed using SAS. The programmer also modified the queries as needed for specific analytic projects.

"The database is so complex, it's not something you just easily query information from. The data are kept on a server, not the desktop, so the IT person has to collapse the database and turn it into a flat file. Actually pulling out data is too complex for [our] IT person."

"We didn't understand the IT support needed to extract data... At the health department, we can't have access to SQL tables, only IT can, so we have to ask them to help, and we're not paying them..."

"...[the data] come to us in series of a couple dozen different tables and they must be linked. It's very laborious to take twenty-five tables and determine which variables in which table you need."

"We have one individual in the IT department that has assisted us with NVDRS since the beginning."

"This is not a program for a cookie-cutter process where we have a problem and IT can assign someone to the problem."

Communication

A state violent death reporting system program also could benefit from a person with the ability to accurately and efficiently discuss IT and computer programming matters with CDC, IT staff in the state's IT division, IT staff in partner agencies such as the medical examiner's office, and NVDRS program staff.

Historical knowledge

Grantees found it beneficial to have consistency among the IT and/or computer programming staff so they could develop a historical knowledge of the NVDRS program and its needs.

"The person who's the lead person could be retiring, which means we have to look at someone without historical knowledge... this is not a program for a cookie cutter process where we have a problem and they assign someone to the problem."

"We have one individual in the IT department that has assisted us with NVDRS since the beginning. He continues to help us and understands the system."

IT and computer programming needs for setting up the NVDRS

Setting up a secure server, installing the requisite NVDRS software and working through data security issues went quite well for some grantees, but did not for others. As mentioned above, the level, quality and responsiveness of IT and computer programming support for each state's violent death reporting system program varied, and this variation likely affected the process of setting up the state's program. Grantees reported that CDC has made improvements in its NVDRS protocols and software since the first round of cooperative agreements was awarded in 2002. CDC also maintains an NVDRS helpdesk which grantees can access via email. Grantees' experiences and insight into the installation of a secure server and program software, as well as data security issues, are presented below.

Secure server

Important considerations in setting up the NVDRS in each state include identifying and determining a useful location for a server that CDC and state IT managers consider secure. CDC's NVDRS software contractor must also be able to access the server. States came up with their own creative solutions, including using:

- a server within the state health department,
- a server located on the same floor as the state violent death reporting system program with a backup system in the state vital records office (all within the state health department),
- a stand-alone server separate from state health department servers,
- a server in another state agency that provides one of the requisite NVDRS data sources, or
- a server at a state university contracted to manage portions of state violent death reporting system program activities.

Grantees reported that when servers are physically located at a site other than the state health department, some additional up-front work may be needed, such as setting up staff members' access to the server through a virtual private network (VPN), going through a clearance process or paying for VPN set-up and data storage fees.

"Our program has a server that's one step removed from the state. It's secure and functioning on its own behind firewalls. By having our server reside there, we could identify designated staff that would do installation of the original NVDRS software and be the key person to do updates and work with CDC if there were problems."

"We use our standard health department servers. No one from the outside can come in, [the data sources] don't import directly into our servers. The only data imported are the health statistics from here in the state health department. They send me a file and I do the import, so there is a limited number of people with access."

"There needs to be IT support to at least set up the SQL server(s) and perform the server updates if the program applying cannot do it themselves (either because of lack of ability or access). There obviously needs to be a lot more than that for sustaining the program, but you can get case one in."

NVDRS software installation

Staff members from CDC's NVDRS software contractor visit each participating state to install the requisite software. Grantees described varying experiences with the software installation process, but as noted above, improvements in the software have been made since the first cooperative agreement was awarded in 2002.

"We installed software in March 2004, someone from [software contractor] came to do the installation, and we've had no problems."

"We had software issues initially. These have decreased over the years, but problems still arise periodically. We have had laptop issues, but the NVDRS helpdesk and [software contractor] have been very helpful."

"Getting the NVDRS database installed and functional took somewhere between six to nine months. The installation of the NVDRS software required a strong relationship with and commitment from the IT staff. A large portion of the first year's field work was done on paper."

"If someone is coming on board now, they may not experience some of the same issues as we did as a first round recipient of the grant. . . there were issues around the software, getting it set up, figuring out who would maintain what. They were resolved through lots of telephone calls, notes back and forth to the CDC help desk. We used a lot more of our internal IT resources than any of us expected to work things out."

Data security problems

Grantees also recommended addressing possible data security problems and requirements of the state health department and each of the major NVDRS data sources. The flexibility of state systems - particularly the state's IT department or agency - may vary and require creative problem-solving on part of a state's violent death reporting system program staff, as the following examples from grantees illustrate.

"... we're a stand alone from the state, so there were fewer security concerns. When there were security concerns, we tried to deal with them at the early phases of the program. Our department has pretty rigorous security protocols for confidential data, so this fit into existing protocols. There were some initial security issues about how the data would be transferred from us to CDC."

"... we set up a meeting with [the state IT agency] and a lot of people were there. We presented that we wanted county people to connect remotely to a state server and edit and control it from there, and they said no one can operate the state network who's not a state employee. We tried to think of alternatives and they had a zero tolerance for risk policy. So after that, we worked with local IT folks..."

Updates

IT and computer programming capacity also must be considered for the required periodic software updates from CDC. CDC provides notice of an upcoming software update, and coordination among state violent death reporting system program staff and IT and computer programming staff is needed to schedule and complete these updates on each of the program's desktops and/or laptops.

"We have software on four desktops and a laptop. We all agree on a day for the updates. We're all here, so within half a day, we can do updates."

"We have software on four desktops and a laptop. We all agree on a day for the updates, we're all here, so within half a day, we can do updates."

"... if the updates are fairly simple, our IT guy calls each district office and coaches them over the phone. If they're not, he goes to each office."

"We've had to wait in line for state IT help. They have other priority issues. Every time a software upgrade comes out, it is not an insignificant amount of work."

"It depends on the other demands of IT staff at the time of the updates. In general, we are able to do updates in a timely manner... sometimes it's hard when updates occur when [IT staff] has other work."

DATA MANAGEMENT

CDC's NVDRS Implementation Manual provides detailed data access and management information for each of the major NVDRS data sources: death certificates, reports from medical examiners and/or coroners, Supplemental Homicide Reports (SHR), law enforcement case reports, and crime laboratories. The manual information includes suggestions for accessing the data, the pros and cons of manual versus electronic formats, potential data quality issues, and planning for factors such as the timing of data releases.

Given the information available in the implementation manual, this section of the Lessons Learned report focuses on information gathered through interviews with the 17 NVDRS states that can provide further insight into the realities of accessing and collecting the requisite data, the obstacles grantees encountered, the solutions they derived, and challenges that may remain.

Accessing and collecting NVDRS data

To collect the requisite NVDRS data, some grantees found that the process worked, for the most part, as they had planned with each data source when they established the MOUs for the cooperative agreement application. Others found that once they began receiving and working with the data, the process needed improvement to ensure that complete and comprehensive data were collected. And for some data sources (e.g. in a state without centralized medical examiner or coroner systems), substantial, unanticipated efforts were needed to access and/or abstract the data, despite the existence of a signed MOU from a requisite data source.

Challenges in accessing law enforcement data, and to a lesser extent, medical examiner or coroner data, were most often cited by grantees. These challenges included:

- the large number of and lack of uniformity among the jurisdictions of law enforcement agencies, medical examiners and/or coroners;
- resources (or lack thereof) within the agency providing data for the NVDRS;
- the degree to which the agency perceived the NVDRS to be valuable;
- concerns about confidentiality; and,
- whether or not the data could be accessed through a centralized state office or database.

“Coroners are elected officials here, and in about thirty-four to thirty-five of these jurisdictions, they’re also sheriffs... [their] focus is on law enforcement and they tend to see public health as a burden that doesn’t help them anyway.”

In addition, one grantee reported that the state's geographic size was a factor in accessing NVDRS data, since much of the law enforcement data was not centralized or available electronically, and costs associated with staff time and travel to remote areas to abstract data were significant.

The sheer number of local law enforcement agencies to be contacted by state violent death reporting system program staff was sometimes a barrier; in some states, there are hundreds of these agency jurisdictions, and in at least one state, thousands. Some grantees have taken a phased approach, gaining participation of large metropolitan jurisdictions that comprise a significant percentage of the state's total violent deaths and then building relationships with other jurisdictions to increase overall participation.

“We have more than 100 counties and no replication in the coroner's reporting system. Just getting enough support to apply for the grant was a challenge. For our cooperative agreement application, the top ten counties agreed to participate. I had to get forty percent to show that I could get the rest.”

“There are eight counties that encompass about seventy percent of violent deaths... in the first year, I would get coroner and law enforcement data for those counties, and then grow over time, so there was less pressure during year one to get every case... I try to do presentations at county coroners meetings, and I had other counties that were interested, so I ended up sending out letters to every county to see what we'd pick up, and we have ninety percent of counties with law enforcement and coroner data, which is more than we expected.”

The culture and relationship of law enforcement with public health also may play a role in accessing NVDRS data. Grantees reported that these relationships often varied among local jurisdictions, in part due to whether or not the agency perceived the NVDRS as a valuable system, had resources to participate and/or had confidentiality or liability concerns about providing the data. Likewise, some grantees reported that they needed to contact the medical examiner and/or coroner in individual counties and/or major metropolitan areas.

“Coroners are elected officials here, and in about thirty-four to thirty-five of these jurisdictions, they're also sheriffs. In larger jurisdictions, they tend to be more professional and accepting of surveillance, but in small jurisdictions, the focus is on law enforcement and they tend to see public health as a burden that doesn't help them anyway.”

In one state, the principal investigator said she always pursues a diplomatic solution first, but when necessary, she can issue a subpoena for a record through the state health department.

"We have the right to request records for surveillance... The subpoena has not been adversarial. For the most part, law enforcement likes that because it relieves them of culpability. They're glad when we say we can subpoena a record. It's not been a tool that's caused bad relationships. Sometimes [staff] has to talk through it with them, and once they understand, they're supportive."

Grantees also found that they needed to address a variety of confidentiality concerns among data sources.

"There is some reluctance on the part of some police departments to share data on ongoing cases... It seems to depend on the police department and the case status, but some will give us a ton of stuff even if the case is under investigation."

"There were some things people just didn't realize until we began implementing NVDRS. The people at the [state] bureau of investigation were interested during the application process, but when it came to implementing, lawyers got involved, and were concerned if [NVDRS] would jeopardize law enforcement power. We are a state where the state medical examiner's office is within law enforcement, and law enforcement was very nervous about sharing data about prosecutions. So we don't get state medical examiner with names and we have to do a long matching process. The [state] bureau of investigation won't release identifiers for legal reasons and that's a huge restriction to us."

"There were concerns about confidentiality from the state toxicology lab and concerns about discovery with one county prosecutor. Some county prosecutors are unwilling to give us access to open homicide files. They will give them to us when they are closed, however, so that issue is more a matter of meeting the [CDC] data deadlines, not totally being denied access."

"Yes, there were concerns about confidentiality. Most are dealt with once data providers realize that NVDRS is HIPAA compliant, state analysis will not release identifying information, and personal identifiers are not sent to CDC. A few jurisdictions have asked for and received a formal letter from the [state health department] stressing the confidentiality of the data. Some jurisdictions have the abstractor visit them rather than mail or fax reports to us. Also, incident reports may be accessed under the Freedom of Information Act."

"We have the right to request records for surveillance. Law enforcement is glad when we say we can subpoena a record. It's not been a tool that's caused bad relationships. Sometimes staff has to talk through it with them, and once they understand, they're supportive."

To minimize the resource burden on both NVDRS data sources and state violent death reporting system program staff, several grantees reported that they are working with their state law enforcement officials or medical examiner/coroner's office and associations to move toward a central electronic system.

"Simply the process of requesting, receiving and tracking the [police] reports takes time. We are working with [the state law enforcement division] for electronic access to incident reports to minimize staff time and burden on local agencies."

"In some of our local jurisdictions, they're using confidentiality as an excuse, but really it's a resource problem. Our local police departments vary with electronic capabilities. Some are heavily computerized, some are not. Their ability to provide themselves and us with automated systems isn't much, so if we could help them [to develop] a statewide electronic system, their participation in that would enable them to organize their own data."

Other grantees found that traveling and abstracting on-site helped to minimize time and resource burdens.

"The medical examiner's office is on the other side of town. Our abstractors go there and are literally working in someone's lunch room. It's inconvenient, but it's very feasible for our abstractors to go right into the office, get the files and then replace them. We're not depending on anyone to pull, copy and mail the records."

"At the end of the year, we send letters to police departments of concern. If there are more than eight or ten cases, then it's my preference that the abstractors go there... Traveling is worth it. You don't go around each time a case comes in. You wait and aggregate until you have a couple days worth of work. The delay is not that critical."

Several grantees emphasized the importance of working with the data sources to incorporate their preferences or concerns regarding confidentiality, staff time and agency resources into the processes of data access and abstraction.

"We approach the sheriff's office first. If they didn't cover the case, they recommend who we should talk with. Most are willing to mail, email or fax. Some make copies and the abstractor picks them up. Others ask the abstractor to come to their office. We let them tell us how they're willing to share to make it least burdensome on them."

"The medical examiner's office is on the other side of town. Our abstractors go there and are literally working in someone's lunch room. It's inconvenient, but it's very feasible for our abstractors to go right into the office, get the files and then replace them."

"In two large metropolitan counties, the coroners didn't want to send paper copies, so we send an abstract form to them and they fill it out and send it back."

"We send letters to coroners for copies of the investigations and autopsies and staff abstract information manually from hard copies. In two large metropolitan counties, the coroners didn't want to send paper copies, so we send an abstract form to them and they fill it out and send it back. The limitation is the only information we get is what they're willing to put on that form. It's not the same as being able to look at all the information ourselves."

Grantees have developed other creative solutions to improve data access and collection.

- A checklist of data elements needed for the NVDRS is provided to law enforcement or medical examiners/coroners, who fill it out and return it so state NVDRS programs collect at least the initial, basic data needed (e.g. age, race).
- A list of violent death cases is provided to the state's child death review board, whose staff member completes a child fatality review abstraction form and sends it back to the state NVDRS program.
- A single log to track all records from each data source was developed. This log helped staff members to avoid creating duplicate incident records, to know where to look for a report once it arrived at the program office, and to know at any given moment key information such as the number of reports received from each agency/data source, when the report arrived, if/when it was entered into the NVDRS database, the NVDRS database number assigned to the report, and how many incidents involve more than one person.

Also see the Partnership Development and Maintenance section of this report on page 11 for additional ideas on how to build effective relationships and share resources with NVDRS data sources.

Examples of NVDRS data access, abstraction and database input

Detailed examples of how grantees accessed, abstracted and inputted data into the state's NVDRS database are provided below. These examples are presented to demonstrate the diversity of approaches grantees used to access and collect information from the major NVDRS data sources; the examples do not reflect a comprehensive list of all approaches used in all 17 NVDRS states. In addition, grantees' experiences using newspaper clippings as a source of relevant NVDRS data are presented. Some grantees also reported gathering information from state child fatality review teams, domestic violence/intimate partner/family violence reports and county prosecutors.

Death certificates

- Data generated via an electronic list from vital statistics; state violent death reporting system program staff manually pull a copy of death certificates for quality assurance check, enter data into NVDRS system, compare data gathered from obituary and other newspaper article clip services, and provide feedback to vital statistics on data quality
- Electronic death certificate file is imported directly into NVDRS software; variable fields are checked manually for accuracy; data for about 15 variables are manually entered into NVDRS database
- Paper death certificates, available six to eight weeks after death occurs, are used
- County health departments in five major metropolitan areas are contracted to access hard copy and abstract data at local level; state violent death reporting system program also is working to receive data electronically from state vital records office

Medical examiner/coroner reports

- Data obtained from paper files from centralized medical examiner office; as part of legal assurance agreement, staff place a signed statement in file noting who abstractor was and that info abstracted for NVDRS; data are hand-entered into NVDRS database
- In a state with an independent coroner in more than 60 counties, letters sent to coroners requesting paper copy of files; data manually abstracted from hard copies; abstract form sent to several county coroners not willing to send a paper copy of coroner's file
- In a state with both coroners and medical examiners functioning independently at the county level, much of data is accessed through state bureau of investigation, where data needed for NVDRS are housed in multiple databases; medical examiners' offices in several large metropolitan counties accounting for about half of state's population submit data electronically or via paper copies; for some counties, staff go to county medical examiner's office to manually abstract data
- Access to data from chief medical examiner's office is given when vital statistics identifies a death as qualifying under operational definition/ICD-10 code; due to terminology differences, medical examiner's office also provides a list of all deaths recorded as suicides, homicides or in an undetermined manner; end result is a list of deaths identified by death certificate but not screened by medical examiner or vice versa; usually amounts to fewer than 20 cases at year end that are not in agreement and must be matched by hand
- Majority of data are abstracted from paper copies through centralized state medical examiner office; although all data ultimately ends up in this central office, to deal with time lag, staff members travel to two other offices in state to manually abstract data
- County health departments in five major metropolitan areas are contracted to access hard copy and abstract data at local level, but in the future, the state violent death reporting system program anticipates collecting this information electronically through a state-level electronic death reporting system
- In a state where the state violent death reporting system program is located in the chief medical examiner's office, the office has jurisdiction over each violent death; staff manually abstract data from medical examiner file, which routinely contains the death certificate, medical examiner and autopsy reports, police reports, and crime laboratory analyses; staff seek supplemental information for NVDRS as needed

Law enforcement

- State police provides an annual electronic database of its relevant cases (and also provides the Supplemental Homicide Reports and crime laboratory reports electronically); state violent death reporting system program also receives data from police departments in two of the state's most populous metropolitan areas
- State violent death reporting system program works with 60-80 of 240 law enforcement jurisdictions on a regular basis, covering about 80 percent of the state's violent deaths; contractor with the state violent death reporting system program manually abstracts data into laptop computer on-site since paper copy not provided for homicides (but is provided for suicides)
- Data for about 85 percent of violent deaths are accessed by working with individual jurisdictions or abstracting police records found within medical examiner's reports; one large metropolitan area is not comfortable with any other agency counting criminal acts in the city
- Majority of 250 local law enforcement agencies send incident reports to state violent death reporting system program, whose staff abstract data by hand; two large metropolitan police departments require state violent death reporting system program staff to abstract data on-site
- Most of state's law enforcement-related circumstance data for homicides are accessed from county prosecutors
- Data are received from about 160 agencies, including those in very rural, remote locations; electronic data submission is primarily from a large metropolitan city
- Full-time state bureau of investigation officer supported by state violent death reporting system program funds obtains police reports and enters data into computer at state bureau, where Supplemental Homicide Report data also are accessed and abstracted
- Police records are received electronically from one major metropolitan city and hand-entered into NVDRS database; other law enforcement data are gathered from Supplemental Homicide Report annually via the state department of justice

Supplemental Homicide Report

- Data are received electronically on a quarterly basis from state bureau of investigation, but data cannot be imported into NVDRS database due to lack of name and other linking information; data from death certificate and Supplemental Homicide Report are matched by variables such as county or date of injury; hand-matching feasible because there are fewer than 200 homicides per year
- State violent death reporting system program sends state police an electronic file with victims' names and a spreadsheet with data elements needed for NVDRS; state police add their data to file and send it back
- Receive annual electronic feed of state's Incident-based Reporting System from state bureau of investigation; this file contains additional data that is not provided in the Supplemental Homicide Report

Crime laboratory and toxicology reports

- Data received electronically from state bureau of investigation; data abstracted three to four times a year
- These data are rarely accessed because information is contained in medical examiner or law enforcement reports
- Toxicology and ballistics information included as part of reports from medical examiners or law enforcement
- Toxicology information received from medical examiner's office, which performs toxicology data on about 96 percent of deaths, regardless of manner of death
- Similar to process described above for Supplemental Homicide Report, the state violent death reporting system program sends a spreadsheet to a major metropolitan police department crime laboratory and to a state police crime laboratory; laboratories complete the spreadsheet with data elements needed for NVDRS
- Ballistics information is received from state police; toxicology reports are gathered from medical examiners' reports or county prosecutor files, although not all cases are covered by these sources; data hand entered into NVDRS database
- Toxicology reports gathered from medical examiner's reports; crime laboratory data gathered from police departments that have their own laboratories, as state crime laboratory within state bureau of investigation was not willing to participate
- When toxicology reports typically were not found within coroners' reports, state violent death reporting system program began requesting toxicology reports separately from the state medical examiner's office

Newspaper clippings

Several states supplement their primary NVDRS data sources with newspaper clippings of an article, obituary or law enforcement report about a violent death. The clippings are provided through a clipping service or collected by state violent death reporting system program staff. At least one state receives an electronic copy of each article, which state violent death reporting system program staff review and manually abstract for relevant data. Other grantees reported that when clippings are available, they add a hard copy of the article to the paper file maintained for each violent death case. The data gathered from the clippings may be added to the NVDRS database using a text box in a document field or by using the database's plug-in component (PIC) function.

Grantees reported that newspaper clippings help to identify cases more quickly than through state data sources, identify cases that otherwise may have been missed or miscoded, and gather additional information such as the number of and relationships among victims and/or perpetrators.

"Our news media is an incredible surveillance resource. We have been able to identify cases where something occurred in a village and it may or may not have been noted correctly in the death certificate. It provides additional information for us to have a reasonable discussion with the medical examiner to make a change in the death certificate and give a specific cause of death as opposed to undetermined."

"It helps us identify if two people were killed in the same setting, or if it was a murder-suicide combination. Now that we have had a couple years of data, homicides are coming to trial. I like to follow up to keep track of the trial, to close the loop on a case. On occasion, if it's a high profile suicide, it helps us work with our suicide prevention folks to identify if there was some prevention information that could have been included in the article."

"Newspaper articles provide detail and provide it early on in a case... They supplement the information we get from other sources. They may provide relationships, the people involved, who's related, who's onsite, who's a witness. They provide links in cases where we may not realize there are separate or related incidents."

"I'd like to do a comparison between what's in a newspaper article versus what's in the NVDRS to see what information there is about family members, if they had children... things that may be able to identify cases that slip by, such as a motor vehicle crash where someone intentionally drove into someone else's car, but the cause of death was coded as motor vehicle crash."

"Our news media is an incredible surveillance resource. We have been able to identify cases where something occurred in a village and it may or may not have been noted correctly in the death certificate."

Format of NVDRS data sources

Grantees commented extensively on the various formats in which they receive and then input data into the NVDRS database. These formats included paper copies, electronic data files or a combination of both. Many grantees found that even when a data set was available electronically, they needed to hand-abstract data into the NVDRS database. As grantees' statements below illustrate, reasons for hand-abstracting included ensuring timeliness of data access, collecting variables that are not included or do not match the standard variable fields when data are electronically imported into the NVDRS database, and/or avoiding confusion in terminology among data sources. At least one grantee wrote a computer program to electronically transfer some data and reduce the amount of information that needed to be hand-abstracted.

"Even when the data are electronic, you may need to hand abstract. We use the death certificate for case identification. We go through paper copies. If we wait until mid-year, we can get the data electronically, but we need it right away, so we use the paper copies."

"All sources are in different formats and timeframes. Some are on paper, electronic or a combination. We have to supplement the electronic copy by doing hand abstracting. We have to manually code vital records. Many are not coded. No two agencies do anything the same."

"We identify deaths electronically and once the software was given import capability, we did that, but not all variables can be imported, so the statistician goes to the paper copy to verify that the case should be included - and not just go by the ICD-10 codes - and then we get additional variables."

"The medical examiner's file is in an Excel format, but a great deal of the NVDRS variables are drawn from the narrative, not the variable fields themselves. For example, the 'body location' or 'location' fields in the medical examiner's report refer to the location the medical examiner goes to pick up the body, not necessarily where the injury occurred. If the person made it to the hospital and died there, the body location is the hospital."

"The state electronic criminal databases we planned to use did not have personal identifiers, so it was difficult to match with the deaths, and they didn't have all the variables NVDRS was asking for... We worked with sheriffs associations, got their endorsements and went to individual localities."

"For death certificates, I developed a program to provide strings needed for electronic import into the NVDRS database. Some information is not electronically coded by vital statistics. The case gets initiated electronically, but we have to obtain paper copies to get variables that we need, such as veteran status or occupational information... The medical examiner is currently working with staff to develop a similar translation program to take information from the medical examiner's files and translate and import it into the NVDRS database. We will still have to abstract records, but it cuts down on time to pull information like name, county, etcetera so we can focus more on the story and circumstances versus basic demographics."

Adjustments to data access and collection processes

In managing data access and collection, some grantees reported that they had to adjust their approach with a data source in order to collect the necessary data or identify and match deaths with other NVDRS data sources.

"We were one of the first funded states. We underestimated the depth of data we would need. We played a lot of catch up, especially with law enforcement. Our MOU was with the state police who had the supplemental homicide report, but it became clear that we had to reach out to police departments and get suicide data from the local level."

"We realized we did not have a sufficient agreement for all the law enforcement data that was required in the first year... and we realized we were not getting sufficient toxicology reports... We are working with our contact in the attorney general's office, trying to expand the existing data agreement and/or we're contacting the [local] source."

"The state electronic criminal databases we planned to use did not have personal identifiers, so it was difficult to match with the deaths, and they didn't have all the variables NVDRS was asking for... We worked with sheriffs' and police chiefs' associations, got their endorsement and then went to the individual localities. We requested copies of incidence reports and supplemental homicide reports based on death certificate information... Now the state law enforcement division is building a new criminal justice database... and we will soon be in the process of utilizing that database."

One state reported that adjustments were needed when the total number of violent deaths was greater than estimated for the cooperative agreement application. When the state applied in 2004, it used 2002 National Center for Health Statistics data to count the number of violent deaths and based its funding request to CDC on those numbers. As a testimony to the value of the NVDRS, once the state received funding and began data collection, more than 200 additional violent deaths - and even more victims - were identified. The state NVDRS program received in-kind assistance from other state health department programs to manage the additional data abstraction needed during that year.

Lag time

Part of NVDRS data management includes planning for the inevitable lag time that occurs at several points along the continuum of data collection, analysis and dissemination. These steps include when the violent death occurred, the incident is accounted for by each of the major data sources, the data are obtained by state violent death reporting system program staff, the data are abstracted and entered into the NVDRS database, the data are cleaned, the data are analyzed, and, finally, the data are released for dissemination.

"We get incremental data feeds. The first bit of information tells us who and the manner of death. Three to four months later we get the ICD-10 codes."

Although some data sets are available electronically, some grantees said they can initiate a case months earlier if they pull paper copies of data such as death certificates. Depending on the data source and the complexity of a violent death case, data sources may provide data as soon as an incident report is completed, three months later, or not until nine months to a year later. ICD-10 codes for death certificates may not be available until after death certificates are accessed. And, the flow of data elements needed for the NVDRS may be incremental. As one grantee described:

"We get incremental data feeds. The first bit of information tells us who and the manner of death. Two months later there's more information, and three to four months later we get the ICD-10 codes, so there's a regular updating of data streams."

To ensure an uninterrupted, ongoing data flow from data sources willing to submit data via fax, one grantee recommended setting up a dedicated fax machine that is secured both day and night to receive only NVDRS-related data.

Some states reported that their annual NVDRS data files are completed and ready for release before a major state data source such as vital records finalizes its annual tallies. To account for this lag time and avoid confusion if final numbers between these two sources differ, one state recommended providing aggregate data, using the term "preliminary data" and attributing the NVDRS database as the source of the information. Some basic background information on how violent deaths are counted, compiled and analyzed within the NVDRS may also help clarify differences between NVDRS data and other major state data sources.

Grantees also found that they needed to plan for the lag time that occurs between when state violent death reporting system staff members enter data into the NVDRS database and when the data are analyzed by CDC for internal quality control feedback to each state. Communication between grantees and CDC is important to address potential differences between the initial - but often yet to be finalized - data file submitted to CDC for periodic quality control checks and the data file completed at a later date that reflects the state NVDRS program's final numbers for a given year.

Some states reported that their annual NVDRS data files are completed and ready for release before a major state data source such as vital records finalizes its annual tallies. To account for this lag time, one state recommended providing aggregate, "preliminary data."

In addition, at the end of each year, CDC provides each state with a SAS data file containing the data submitted by the state to CDC. However, a state does not have to wait for this file in order to analyze its NVDRS data. A state may create its own analysis files and even produce annual reports that are generated using its own files before receiving the SAS data file from CDC.

DATA CODING

Grantees shared several lessons learned about coding NVDRS data, and also discussed resources for getting help with coding questions.

Coding challenges

Differing definitions among common variables

A starting point for accurate coding includes becoming familiar with the definitions of common variables among data sources, and understanding how they may differ. For example, grantees reported that variables such as "location," "place of death" or "victim" can vary in meaning from one data source to another. Or, the way a variable is coded for the NVDRS database may not correspond with how a state data source codes it.

"Coding questions often are related to trying not to be subjective in interpreting data, trying not to infer what is being said. If it's not on paper, you can't infer your own interpretation of the information."

Objectivity

Grantees reported that to obtain objective coding they needed to address factors such as the subjective nature of some violent death-related data and differences in interpretation of data among abstractors. Frequent communication and meetings were recommended to ensure accurate and objective coding.

"Coding questions often are related to trying not to be subjective in interpreting data, trying not to infer what is being said. If it's not on paper, you can't infer your own interpretation of the information."

"We had coders from different backgrounds who used past knowledge to code certain variables. We have tried to address this. We instituted some quality control measures including re-abstraction and re-analysis. We hold meetings to discuss specific cases where, due to the subjective nature of the variables, there may be issues or differences among abstractors."

"We do not have difficulty with variance. Our evaluation shows high consistency among staff with regards to coding variables. Guidance from CDC and the contracted assignments to test for variability have been helpful."

Data source coding changes

Changes in or updates to how an NVDRS data source codes a violent death also may occur. For example, one grantee described how a death certificate can be amended multiple times to include updated information as it becomes available, such as victim demographics or a different cause of death based on a toxicology report. Since the database does not automatically generate a cue that something has changed, the grantee reported the need to do line by line reconciliations within the database.

Mental health-related information

Grantees frequently mentioned the challenges of coding mental health-related information.

"For the issue of a mental health diagnosis, formal documentation is required. It can't be that a family member mentioned it, that a person has depression. The reality is that on the coroner's report you may get one sentence about mental health and you don't have that level of detail, so if it doesn't meet the [coding] criteria, do you just write unknown, or include what you have?"

"Usually, a current history of a mental health problem such as depression or bipolar disorder is noted, but rarely do we know if they were under current treatment or had ever been treated for this."

"We code objectively but the variables themselves are subjective. They are mostly defined by the victim's perceived crisis and problems and this may present problems when trying to analyze their effects. Being unemployed for me may be a crisis but not for someone else... and when someone commits suicide after a catastrophic diagnosis... it may not fit the definition of 'physical health status' as it is now, but to say there was not a physical health issue is ignoring a huge risk factor."

Coding resources

CDC has published an NVDRS coding manual and offers annual coding training for NVDRS grantees. CDC also offers several other options for asking coding questions, discussing problems and brainstorming solutions. Grantees can get input via the NVDRS helpdesk, direct calls to CDC program staff, monthly conference calls with all grantees and CDC program staff, and NVDRS grantee meetings and reverse site visits. Grantees emphasized how much they benefited from discussing coding challenges and solutions with their NVDRS program peers in other states. Some changes have been incorporated into updated versions of the NVDRS software and coding manual.

"A lot of what comes up is during the monthly conference calls. That's where issues come up and we can discuss them. You don't know something's a problem until it comes up when people are talking about it. Those are very important."

"The software requests six codes for city and counties, but a lot of our deaths are in unincorporated areas, not in a given town. People don't always die in their own backyard. They go up to the mountains. We struggled with that a bit, but came up with a solution with CDC."

"Coding questions often are related to trying not to be subjective in interpreting data, trying not to infer what is being said. If it's not on paper, you can't infer your own interpretation of the information."

"The software requests six codes for city and counties, but a lot of our deaths are in unincorporated areas, not in a given town. People don't always die in their own backyard. They go up to the mountains. We struggled with that a bit, but came up with a solution with CDC."

"One or two mistakes were identified at the end of year one, such as 'ever treated' not being coded correctly. Some coding corrections have had to be made on a large scale as a result of changes and discussion presented at annual coding training meetings."

Resolving coding issues can be challenging, grantees reported, particularly given the complex nature of the NVDRS, the ambiguity of some information in violent death records, the need for objective judgment of sometimes subjective data, and the need for solutions to highly unique and situation-specific coding questions that cannot be addressed in a standard coding manual. Changes in NVDRS program staffing at state and federal levels also may affect communication about coding. Grantees reported an ongoing effort with CDC to find ways to refine the coding of NVDRS data, the coding manual and overall communication about coding changes or issues.

Grantees also have developed their own tools to aid in coding NVDRS data. For example, to improve consistency in toxicology coding, one grantee developed a "cheat sheet" by compiling a comprehensive list of generic and non-generic drugs, grouping the drugs into categories relevant to the NVDRS, and saving it into a single file for all program staff to access.

DATA ANALYSIS

Approach to data analysis

Although basic descriptive epidemiology practices and CDC cooperative agreement requirements guided states' analyses of NVDRS data, grantees reported that other factors also helped to shape their decisions about the focus, organization, format, timing, and audiences for the analyses. A summary of these considerations and suggestions for analyzing NVDRS data are presented below.

Review existing NVDRS state reports

An obvious starting point for several grantees was the review of existing annual or other reports from other NVDRS states. The reports can provide examples of analyses and queries to run, sample templates or formatting, and ideas on how present data when there is a small N (e.g. due to a small population or because one or two years worth of data does not adequately populate variable fields).

Reflect analysis advantages unique to NVDRS

While it may seem obvious, several grantees emphasized the importance of conducting analyses that reflect unique and powerful capabilities of the NVDRS.

"More fruitful and interesting analysis will come from looking at multiple sources [of violent death data]. I want to make sure our analysis shows how we can benefit from this enriched data set."

"We decided to do an initial report showing basic analysis and highlighting additions NVDRS makes possible, such as circumstances and the victim-suspect relationship. We also included geo-coded maps."

"More fruitful and interesting analysis will come from looking at multiple sources [of violent death data]. I want to make sure our analysis shows how we can benefit from this enriched data set."

"Part of the suicide picture in [state] is the role of domestic violence. . . the suicide piece, the perpetration of suicide is linked to domestic violence. We have to put this together, we have to realize that there's a murkiness between suicide, homicide and domestic violence that might strengthen prevention efforts if we take suicidology into account. There's an eagerness to look at the data and take these things into account."

"We put out the standard report that everyone has to do, what I call slice and dice with lots of tables. But we've recognized that there's a richness to this database that will require more than slice and dice reporting. We've begun to explore this with suicide. . . Health officers and counties are beginning to ask us for information that they think will be useful. Now that they know we have this data, they're asking 'Can you help us?' We hope to do a really good job with one or two counties, and that can help us open the door. We'll tailor analysis to their needs and region, and contrast their situation to the rest of the state."

Likewise, one grantee commented on the potential of NVDRS data analysis to examine cases with an undetermined cause of death.

"The neat thing is that [the NVDRS] has embraced. . . the undetermined. The fact is they're a great unknown, in many ways like a sudden unexplained infant death. We need to get in there and understand what the risk factors are. As far as I know, we're collecting the most information on that than has ever existed before, and more is unearthed on that group for every state."

Determine when to "close" a data year

Despite the changing, evolving nature of the NVDRS, grantees had to decide when to "close" the data file for a given year. This decision was also affected by conditions of the CDC cooperative agreement, which requires that states submit preliminary data six months into a given year and final data at 18 months.

"To do analysis, I like closed out data years. NVDRS is a dynamic database. You get new information every day, but for us, 2004 is pretty much closed out, so I feel comfortable that I can analyze it and not repeat my efforts later."

"Death certificate data close at a certain period, but medical examiner records never close, so what if they decide three years down road, oops, that's not accidental, that's a homicide?"

"The database is a living thing. It changes every day. Make sure there are procedures are in place to create a good data set, so you'll have a good data set to run."

"As we get more data, we can start expanding to other areas we should be reporting on. With only one or two cases for some variables, you have to be very cautious that you don't breach confidentiality."

Consider preliminary and final reports

One grantee said that her state's violent death reporting system program strives to produce two reports each year: a technical report with provisional analyses of data from the first six months, and an annual report at the end of the calendar year.

As noted previously, at the end of each year, CDC provides each state with a SAS data file containing the data submitted by the state to CDC. However, a state does not have to wait for this file in order to analyze its NVDRS data. A state may create its own analysis files and even produce annual reports that are generated using these files before receiving the SAS data file from CDC.

Expand analyses with each year of data

Most grantees described how they were able to do additional and sometimes more complex analyses with each year of data added to their states' NVDRS database. Retaining confidentiality was always a consideration.

"As we get more data, we can start expanding to other areas we should be reporting on. With only one or two cases for some variables, you have to be very cautious that you don't breach confidentiality. With a small population, you have to be careful about the release of summary information."

All grantees emphasized the importance of seeking input on NVDRS data analysis from system data sources, advisory group members and other violence prevention partners.

"In the second year, additions were made to the annual report format to include data on suicide among veterans and a review of the unexpected, undetermined infant death cases. There will be additions to the annual report as more data populates some of the variables with small cell sizes."

Get feedback from NVDRS data sources and violence prevention partners

All grantees emphasized the importance of seeking input on NVDRS data analyses from system data sources, advisory group members and other violence prevention partners.

Grantees often conducted some of their first NVDRS data analyses in response to requests for presentations about the new surveillance system from a current or potential NVDRS data source or violence prevention partner. Even if the analyses presented were based on preliminary data only, grantees found that the questions and responses from audience members helped to clarify the focus of future analyses or identify the need for more in-depth analyses. They emphasized the importance of actively listening to such feedback.

"The first challenge is to determine what data users want. Do presentations to show them what's there, and as they become more familiar with what's there, and how it's relevant to what they need and want to promote, then you know what reports to do, what geographic-specific reports you need to look at."

"...this was the first time people had population-based suicide data with some description of circumstances... there's room for growth as people struggle with our data and ask questions."

"This was the first time people had population-based suicide data with some description of circumstances. There's room for growth as people struggle with our data and ask questions."

"October is domestic violence prevention month, and we give talks all over the state. And what happens in those encounters, is that people ask questions about the data and give you advice about how it would be more helpful to them. Or, someone calls you to talk about your report, or comes up to you after you give a talk, and says 'What about this? Can you give me data this way?' This ultimately affects how you code and organize data for a presentation."

"As soon as we make a data presentation, people are asking us really good questions that help us drill down to questions that we can't answer yet. The PICS [plug-in components in the NVDRS database] would be good for capturing that data. We'd like to move in that direction, but we haven't done that yet."

"The data will be used to produce a multi-year report and other publications. We will distribute our report widely and put it on our website. We will contact several prevention organizations and use the report as a platform to offer further data, presentations, articles, etcetera. The report will be great way to start a conversation."

Grantees also gathered suggestions for NVDRS data analyses by directly asking for feedback from state NVDRS advisory group members and other violence prevention partners.

"Our second report is probably a lot more useful. It had a wider airing beyond the advisory council to all of our partners, including aging, domestic violence, suicide, and mental health."

"A survey will be included with the annual summary report of the 2004 data to determine the types of reports and data [analyses] law enforcement would find useful. We will gear our reports according to the results. We will produce more detailed and focused types of reports, not large summary reports."

"Our data have been used by suicide prevention groups and the [city] commission addressing homicides, among others. We are preparing a report and hopefully feedback from that report will inform future decisions."

"Our second report is probably a lot more useful. It had a wider airing beyond the advisory council to all of our partners, including aging, domestic violence, suicide and mental health."

"The suicide prevention coalition expressed interest in deaths with a homicide/suicide combination. For those that aren't domestic violence, often there's an elderly person caring for an adult child, so we're trying to bring out issues of respite care for providers. It's a different tact for prevention folks, to think about elder care in different ways. [Our analysis] highlights that these things do happen, so what can we do to work with that?"

Although feedback from a wide variety of data sources, advisory council members and other stakeholders is essential, given the many potential audiences interested in the data from the NVDRS, grantees may consider developing a proactive plan that balances internal and external data requests with NVDRS program resources (e.g. staff time) and the capacity and focus of state violence prevention programs. One program staff member framed the issue with the following questions:

"What are your priorities for using the data? Are they driven by stakeholders? By the principal investigator? By internal [state health department] requests? What will you analyze first after the basic analyses are completed? Hopefully they are driven by needs of the state. We may not have a program to address an issue, so how can I justify going there when I don't have a system in place to address those most at risk?"

"We look at the data we're releasing versus what our partners are releasing so we begin to have data that are consistent and supportive of these needs. And we look at what is the timetable that partners have, so we can each release data and not steal each other's thunder."

Consider data releases of partners

One grantee described her state's efforts to coordinate NVDRS data releases with data releases of their prevention partners, including those addressing domestic violence, child fatality and anti-gang efforts.

"We look at the data we're releasing versus what our partners are releasing so we begin to have data that are consistent and supportive of these needs. And we look at what is the timetable that partners have, so we can each release data and not steal each other's thunder."

Consider data language and format

Another factor to consider for NVDRS data analysis is how to present the data so it can be easily used by a variety of audiences. One grantee described how her program provides drafts of technical and annual reports and fact sheets to the program's data sources, advisory group members and other prevention partners. She seeks input on data presentation and format and language usage, for example, to ensure that the data presented in the various dissemination materials will be generally understandable for all audiences.

Data Analysis Challenges

Data analysis challenges discussed by grantees focused primarily on the complexity of the NVDRS database, computer programming issues and issues regarding data source primacy.

Computer programming

As with other phases of the NVDRS program, computer programming expertise is needed for data analysis. As discussed in other areas of this report, this expertise may reside among state violent death reporting system program staff, state IT department staff, staff from other organizational units in the state health department, and/or staff from another state agency (e.g. the medical examiner's office). Grantees reported that this programming expertise was needed for tasks such as accessing NVDRS data on the state server and converting the relational database into flat files for analysis.

"The state is on its own and I would recommend highly that someone with very good knowledge of SQL or Access and SAS programming be assigned to this work."

"A number of skills are required. You need to be able to convert the relational database into flat files for analysis and run code within the system... putting that code in SAS requires more than an intermediate level of programming."

"I had to revisit my SAS roots."

While they could wait for CDC to send the state's final data file for analysis, many grantees said they preferred to access the data from the state server. This process typically required knowledge of SQL and Open Database Connectivity, a standard database access method to allow access to any data from any application regardless of the database management system used. Some grantees found it helpful to develop separate, complementary databases to ease the data analysis process.

"We had to create a lot of things to make it work in [state]. We have to create other ACCESS databases that we can store additional data in, and when we pull data off the server, we can link it at that time, separate from NVDRS. So we make the databases complementary, and link as best we can."

"The database is so complex. It's not something you just easily query information from. The data are kept on a server, not a desktop, so the IT person has to collapse the database, turn it into a flat file, and actually pulling out the data was too complex for our IT person. So I created a tracking system. I make my own database for common requests. The CDC database is too complex to query for frequent requests, and dissemination is so important."

Primacy

Determining primacy of a data source and writing computer programs to ensure that those primacy decisions are followed were other challenges that grantees worked through in analyzing NVDRS data. Several grantees also found that it was important to double check data for primacy issues when comparing data generated by the state and the data file sent by CDC.

"Issues with primacy of data sources can only be worked out on the state level as each state has different sets of challenges with completeness and reliability and validity of the data collected."

"Issues with primacy of data sources can only be worked out on the state level as each state has different sets of challenges with completeness and reliability and validity of the data collected. Freedom to create our own primacy decisions is essential."

"Once you have the data from the server, some basic processing needs to be done to let you choose from several variables and data sources. If you want to instruct the computer to get age from the medical examiner records first, and if not there, go to police reports, that takes programming and has to be repeated for hundreds of variables."

"Every variable has two to three primacies. If you go to one data source and data are not there, then you look in another, so there's a huge amount of programming. If there's a glitch in the system and you end up not getting data from one of the sources, your counts are lower."

DATA QUALITY AND NVDRS EVALUATION

Grantees described how they worked to improve data quality within and conduct evaluations of state violent death reporting systems.

Start with CDC's evaluation criteria

CDC has published criteria for surveillance system evaluation. Here's how one grantee described the state violent death reporting system program's current steps to assess the new surveillance system.

"For the next year, we will evaluate the sensitivity and predictive value positive of the ICD-10 external cause of death code for each manner of death using NVDRS as a gold standard. Death certificates and medical examiners' reports are matched and cross matched. We generate a random sample of ten percent of cases for re-abstraction as required by CDC. We assess our reviews but we do not change any of the differences at this point because CDC looks at inter-rater reliability. I do evaluate coding practices through the NVDRS website, looking at circumstances and narratives to see if they match and other things. The database is reviewed regularly for quality assurance."

Another grantee said that although she follows the CDC surveillance system evaluation guidelines, she also has developed an additional set of error and logic checks.

Consider establishing a data quality committee

One grantee recommended establishing a data quality committee, or to at least identify members within the program's advisory group to play this role. Data quality committee members work with the state's NVDRS program staff on several fronts. They review the comprehensiveness and consistency of data entry, assist with training new abstractors, discuss abstraction and coding questions with staff, review potential problems in each of the requisite NVDRS data sources, and if necessary, forward problems to the state NVDRS advisory group for discussion and feedback.

Conduct required case re-abstraction

All states reported doing a re-abstraction of randomly selected cases from the state's violent death reporting system. State violent death reporting system program staff members typically meet with data abstractors to review any problems or inconsistencies.

"CDC was giving us quarterly reports on data in the system and we'd use that. If someone entered something that the system picked up as an error, CDC would send an error report and we could go back and fix it."

"We're experimenting with other ways to improve data quality. We're working on a program to completely adjust all rates not just for age but for race and gender, so we can do meaningful comparisons by county."

Consider budget needs for system evaluation

Several grantees also recommended doing up-front budget planning for the staff or contractor time needed to conduct the multifaceted evaluation of a system as complex as a state violent death reporting system.

"We thought we'd be evaluating one type of system, and then once figured out the [NVDRS] system in our state, it was bigger and more complex than we thought it would be."

Consider data quality issues in all program phases

Data quality issues were identified by grantees through their experience working with data abstraction, coding and analysis. For example, several grantees recommended further work at state and federal levels to improve the coding of mental health-related data. And, the quality of a data source may vary from state to state. Ensuring that all state violent death reporting system program staff members spend at least some time abstracting data can help them gain a solid understanding of the quality of each data source in the state.

Likewise, grantees have addressed improvements in data quality during data analysis. As one grantee described:

"We're experimenting with other ways to improve data quality. We're working on a program to completely adjust all rates not just for age but for race and gender, so we can do meaningful comparisons by county. The differences in race and gender are so huge, age adjustment is insufficient. I think it will give more honest comparisons among regions of the state."

Consider additional measures of a successful surveillance system

In addition to the CDC guidelines on surveillance system evaluation, several grantees pointed to milestones that they consider as measures of a successful NVDRS.

"Effectiveness is not a system attribute that we evaluated. My opinion is that effectiveness could be measured by defining how the data were used to define problems and risk, develop collaborations around an issue, suggest interventions to the defined problems and risks, communicate new knowledge to policy makers, and develop questions for further research."

"The first measure of success will be when county health officers say this information is really helping, helping us work together with law enforcement on joint projects, to get our resources going in the right direction...help communities trying to deal with these problems to develop solutions, understand where the problem is, who's at risk, where the problem really sits. A lot of folks have good gut feelings, and we can back them up with numbers to confirm or negate those hunches."

APPENDIX A

Initiating a Violent Death Case for the NVDRS

Grantees described the multiple methods by which state programs initiate a violent death case for the NVDRS.

- Vital statistics bureau; occasionally by medical examiner or law enforcement
- Counties use different methods (some use death certificates, others use coroner records); once cases initiated at the state level, will use the manner of death field on the death certificates to initiate cases
- Death certificate from vital statistics; after download, send letters to coroners for investigations/autopsies; staff abstract information manually from hard copies
- Use ICD-10 as our case identification; get reports from vital records with codes and that initiates case; about three month delay until we receive electronic death certificate
- Trail initiated by cooperation between vital statistics and medical examiner; medical examiner working with staff to develop translation program similar to the one written for death certificates to take electronic information from medical examiner files and translate and import them into NVDRS; still have to abstract records, but cuts down on time to pull information like name, county, etc.
- Review hard copies of death certificates and collection of records that are homicides, suicides or undetermined intent deaths
- Death certificate for case identification; go through paper copies; if wait until mid year, can get electronic, but need it right away, so use paper copy
- Case initiated by manner of death on the death certificate; also review law enforcement and coroner/medical examiner records to see if anyone was missed or if the death certificate has not been received yet, or maybe the death certificate was mistakenly filled out
- Case initiated by medical examiner; get list every day from deaths day before; field investigator chooses deaths eligible for NVDRS, gives list to data entry person and she pulls office of medical investigator files; within one to two days after autopsy completed, begin entering data; also have cases reported to vital records but not investigated by office of medical investigator, such as tribal ones; vital records can pull those based on NVDRS selection codes; so may have some cases where only have death certificate
- Begin with manner of death on death certificate; a case is initiated when the death certificate can be matched to a medical examiner case
- Case initiated by manner of death from medical examiner report
- Identify cases using the electronic medical examiner data system that public health (NVDRS, emerging infections and bioterrorism) helped the medical examiner to develop
- Case initiated through ICD-10 codes; statistician accesses the electronic database to identify pertinent death certificates using these codes, and then receives paper copy of death certificates; deaths can be identified electronically, but even with software import capability, not all variables can be imported, so statistician goes to paper copy to verify that the case should be included, rather than relying solely on ICD-10 codes

APPENDIX B

NVDRS Resources

Background on the NVDRS

From the CDC website

<http://www.cdc.gov/ncipc/profiles/nvdrs/facts.htm>

The February 2004 issue of *Injury Prevention*, an international peer review journal for health professionals and others in injury prevention, includes an article on NVDRS background and methodology

<http://ip.bmj.com>

Injury Prevention published a special supplement to its December 2006 issue that focused on the NVDRS.

http://ip.bmj.com/content/vol12/suppl_2/

NVDRS Implementation Manual

<http://www.cdc.gov/ncipc/pub-res/nvdrs-implement/nvdrs-manual.pdf>

NVDRS Coding Manual

<http://www.cdc.gov/ncipc/pub-res/nvdrs-coding/default.htm>

NVDRS data

- From the 2003 data year
<http://webapp.icpsr.umich.edu/cocoon/ICPSR-STUDY/04573.xml>
- From the 2004 data year
<http://webapp.icpsr.umich.edu/cocoon/ICPSR-STUDY/04574.xml>

ACKNOWLEDGEMENTS

STIPDA is grateful for the efforts of many individuals who contributed to this Lessons Learned document and helped make it a useful tool for current and future NVDRS grantees, as well as other state health departments interested in improving violent death surveillance.

Principal investigators and staff from each of the 17 NVDRS states generously shared their time during the telephone interviews, candidly described their experiences with the NVDRS and offered insight into how the system may be improved. In each interview, their commitment to the need for and benefits of developing an effective nationwide, state-based surveillance system for violent deaths was unmistakable. The 17 states are Alaska, California, Colorado, Georgia, Kentucky, Maryland, Massachusetts, New Jersey, New Mexico, North Carolina, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia and Wisconsin.

Leroy Frazier, Jr., of the Division of Violence Prevention in CDC's National Center for Injury Prevention and Control saw the need for an NVDRS *Lessons Learned* document and supported the process of gathering frank feedback from states. He provided guidance to STIPDA staff in developing the document's focus and the content of the telephone interview guide. He also provided valuable review of the *Lessons Learned* document.

Lisa Millet, manager of the Injury and Violence Prevention Program in Oregon's Public Health Division, helped initiate the development of Lessons Learned document, contributed to the development of the telephone interview guide, and provided feedback to ensure that the document's purpose and content would be practical and useful to state health departments.

Kristen Lindemer of STIPDA served as the association's staff lead for the *Lessons Learned* document. She developed the final telephone interview guide, conducted interviews with staff from the 17 NVDRS states, and wrote and edited the document.

Allison Lowe Huff of STIPDA did the graphic design and layout of the *Lessons Learned* document.