NORTH AMERICAN QUITLINE CONSORTIUM

Exploring a National Data Warehouse for U.S. Quitlines

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National Data Warehouse Workgroup
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Summary of Key Findings

Value of a national data warehouse
- There was consensus among workgroup members on the value of a warehouse to the CDC, states, quitline service providers and researchers
- Members identified important potential use and users, especially to:
  - Promote improvement in quitline reach and service quality
  - Identify gaps in service
  - Understand better what services are associated with sustained quits and for whom
  - Improve state-funder access to their own client-level data and improve data quality
- Members concurred that a data warehouse located at and funded by the CDC would have significant advantages

Data needed to maximize utility and value of a warehouse
- Members concurred that client-level data will be needed
- Members concurred that in addition to intake and outcome data, collection of service or intervention data should be pursued
- Timing of data delivery will need to be considered further, e.g. monthly data will be needed to assess certain impacts (e.g. promotion), while semi-annual data will serve to track trends and support forecasting

Issues to be addressed: technical, funding, political
- Members expressed concern with access or use of warehouse data
- Rules and a process will need to be established to triage access
- Thorough pilot testing of data use is recommended
- The time and costs to clean and deliver flat files may be considerable for some state funders or quitline service providers
- A state-by-state assessment of proprietary, permission, IRB, and legal issues pertaining to data transfer will be needed
- An assessment of quitline service provider issues pertaining to data release and other challenges will be needed

Recommended "next steps"
- Conduct a state-by-state assessment of proprietary, permission, IRB, and legal issues pertaining to data transfer
- Conduct an assessment of quitline service provider issues pertaining to data release and other potential challenges
- Develop a matrix that maps the questions (operational, research/trend or various levels of analysis etc) that a data warehouse might be drawn upon to address, by data points needed, indicating which are available (MDS) and which would need to be collected

- Develop concrete examples of how the various "audiences" will benefit from the data warehouse. This should include a vision for the data warehouse based on the ideal scenario (if all the data desired/needed were available) and highlight state, service provider, CDC, NAQC and other national partner needs that could be addressed by a national warehouse.

Introduction

In October of 2005 quitlines across North America were encouraged to implement the North American Quitline Consortium's (NAQC) Minimal Data Set for Evaluating Quitlines (MDS). The MDS is a set of 18 questions and three optional questions collected from eligible callers at intake and 12 questions and one optional question collected from evaluation participants at follow-up. The development of the MDS marked a critical step forward toward data standardization for the quitline community. Although there are variations in implementation across the nation's quitlines, MDS data is being collected by all quitlines at intake and by nearly all quitlines at follow-up (1). If collected routinely and stored in a central repository these data could be used to better understand quitline promotions, develop service benchmarks to improve services and better understand priority populations' utilization of quitlines. Additionally, pooling these standardized data in a central location would allow quitlines to compare results across jurisdictions and provide an opportunity to study these issues on a scale no single quitline is likely to study independently. (1)

Unfortunately a "central location" for MDS and other quitline-related data does not yet exist. However, with funding from the Centers for Disease Control and Prevention Office on Smoking and Health (CDC/OSH) NAQC was tasked with an important first-step toward this end - leading a collaborative process with a sample of U.S. quitline funders to explore states' perspectives on the benefits of, challenges to, and possible solutions for gathering state-owned quitline data in a national data warehouse.

One of CDC/OSH's strategic priorities for 2009 is to sustain and expand the capacity, reach, utilization, and effectiveness of quitline services. Gathering state quitline data, including the MDS and other information, will enable the CDC to promote standardization of the analytic and presentation methods used to demonstrate the availability and effectiveness of quitlines. The MDS and other quitline data gathered in a central location would inform questions related to the CDC/OSH Key Outcome Indicators, including:

- Who is and who is not calling quitlines?
- Who is receiving counseling?
- What are the trends in utilization and cessation over time?
- What, if any, demographic changes among the population of quitline callers are occurring over time?

In order to move forward on this critical strategic priority, CDC provided funding to NAQC to assist in information-gathering to support development of a data warehouse. Specifically, NAQC's data warehouse project objectives were:

1. To clearly define the rewards of gathering MDS data in a central location and the challenges to doing so;
2. To develop strategies to address possible barriers to state participation in a national data warehouse;
3. To publish a report on the above-mentioned rewards, challenges and strategies;
4. To define critical data elements of a national warehouse; and

5. To develop and implement a plan for further engaging states in support of this important benchmarking and research tool.

How the Work Was Accomplished

NAQC convened a workgroup comprised of six state-level tobacco prevention and control program managers and three research and technical liaisons to assist in exploring the possibilities of a national data warehouse for U.S. quitlines. The workgroup's primary purpose was to provide guidance to the CDC on anticipated benefits of and challenges to gathering state-owned data and to define how a national data warehouse would be of use to states. The research and technical liaisons were responsible for ensuring that the workgroup's guidance to CDC was technically and academically sound.

With states facing strict travel restrictions it became clear early in the planning phase of the project that the workgroup would not be able to meet in-person. Instead the workgroup participated in three 2-hour conference calls. The first meeting focused on defining the purpose, possible benefits, and challenges of a national data warehouse. In the second meeting workgroup members were asked to drill down further on issues of concern noted in the first meeting: defining who would have access to data gathered in the warehouse; what types of data to collect; mechanics of data transfer to the warehouse from service providers; types of reports to be generated from the warehouse; and standardization. The final meeting provided an opportunity for workgroup members to identify specific barriers to states' participation in the warehouse and to provide guidance on the best strategies for addressing these barriers. While not as interactive and engaging as an in-person meeting, the conference calls along with individual follow up with various workgroup members allowed NAQC to gather essential direction and advice.

The discussions from all three meetings were captured in a draft report initially vetted by workgroup members. Based on their feedback, revisions were made and this final report was delivered to CDC.

Why a National Quitline Data Warehouse?

A critical objective of this project was to determine whether or not a national quitline data warehouse would be useful to the states and if so, how. Workgroup members concurred that a data warehouse would be useful for states and a vision for its utility emerged from the group's discussions over the three meetings. Workgroup members agreed that a national data warehouse would be most useful to states by increasing accountability, facilitating access to their data and raising the bar on service quality.

Accountability and Funding

Several workgroup members noted the important role a national quitline data warehouse could play in maintaining and supporting transparency and accountability to current funders as well as gaining support for future funding.

A data warehouse could help states to respond to questions from legislators such as "How do the service levels (e.g. reach) of our quitline compare with the other states?' and

"Who calls our quitline and who is our quitline serving, compared with other states and nationally?" with readily accessibly and current data. Questions from potential funders, typically related to demonstrating a need for additional services, could be easily answered and a state would be better able to show trends in utilization over time.

One workgroup member noted that policy makers in her state respond more favorably to examples driven by national-level data than they do to examples highlighting data from one particular state – especially if the demographics or political climate of that state are vastly different. It may also be true that policy makers would want to see data from a neighboring state or regional data rather than seeing national data. The warehouse could be used to generate state, regional or national data and allow states to respond to a wide range of data requests.

Facilitating State Access to Raw Data

Workgroup members felt strongly that a national data warehouse would have a positive impact on facilitating states' access to their raw client data. According to workgroup members some service providers do not provide ready access by the funder to individual-level data. Additionally, some service providers have a difficult time providing raw data to their state clients due to technological limitations.

Workgroup members believe that if there is federal support and funding behind a national data warehouse it would push service providers to make raw data available to their state clients and facilitate better evaluation of services.

Improving Our Work and "Looking Behind the Curtain"

It was clear to workgroup members that another possible advantage to a national data warehouse would be to enable states to learn more about what quitlines are doing well and what they are not doing as well – nationally and as individual states. As a community we would be able to analyze trends in reach, utilization and outcomes over time and better understand how to make adjustments in our practices, policies and programs to influence positive change.

Learning more about our data, or "looking behind the curtain" as one workgroup member noted, would be an additional state-specific use for a national warehouse. If a state does not have access to their client-level data how can they assess the quality and completeness of data behind reports they receive? Is the data accurate? Is the data reliable? A national quitline data warehouse would encourage states' to become more familiar with their data, engage in more analysis of their data and foster improved data quality throughout the field.

What are the questions a warehouse could help us answer?

In an effort to further define an overarching purpose or aim of a national data warehouse, workgroup members explored the various questions that could be answered with data gathered in a central location.

A data warehouse could help states:

- determine the need or demand for services
- determine the need or demand for services across populations/communities
- demonstrate effectiveness of quitlines on a state level; a national level and a population level
- learn more about who quitlines are reaching, especially as reach relates to priority populations
- better standardize the methods of calculating and reporting reach and quit rates
- learn more about the various parameters of service-use
    - Number of call backs completed and length of calls
    - Number of clients who received the full number of sessions
    - Number of attempts made to reengage clients
    - Average number of attempts to reach clients
    - Quit rates for counseling only vs. counseling plus medications
    - Quit rates compared with number of counseling sessions received
    - The relationship between service deficiencies and outcome measures

Not only would a data warehouse allow states to answer these questions but it would also allow states to view trends for each of these over time. This analysis is critical for states when making programmatic decisions related to promotion and service design and delivery. Additionally, the collection of national data over time allows for forecasting on a population-level. In the words of one workgroup member, a data warehouse could serve as an "early warning system," allowing us to see more clearly the direction we are headed. Considering the number of national goals being set for quitlines, a national data warehouse would be useful to determine the degree to which we are moving toward those goals.

> *"...it would be nice to be able to say something about the combination of client characteristics and interventions that makes people most successful. We need to correlate these characteristics and interventions with quitting behavior to learn more about a person's stage of change. This could result in intake classifications that are more closely related to outcomes. This is the sort of thing that could really refine operations."*
>
> *~Workgroup member*

Most workgroup members believe that satisfaction data was important for them to collect and analyze on a state level however it seemed less useful to view on a national level – thus less useful as an element of the data warehouse. Two members expressed feeling leery of satisfaction data noting that it is subjective and that satisfaction seems to increase with increased levels of service (for example, those who receive free cessation medication tend to be more satisfied with the service than those who do not). If satisfaction data were included in the warehouse it would require ample qualifiers so that satisfaction levels were not compared across quitlines offering different levels of service.

County-level information is another data element significant for states but which has less utility nationally according to workgroup members. One workgroup member did note that it would be beneficial if county grantees were able to run queries using the data warehouse rather than depending on state staff to run queries for them. Another workgroup member described the importance of routinely reviewing census and administrative data in addition to service provider-generated reports. While there were not strong feelings on this issue either way, additional input from states on whether or not to include county-level data in the national warehouse is recommended.

While workgroup members believe that data related to promotion is important to gather in the warehouse and would provide additional context to paint a fuller picture of individual quitlines, it is clear that there would be significant challenges in getting these data to the warehouse. For instance, budget and promotion data would be delivered by the state and service data by the service providers. There is also a lack of standardization among states in calculating and reporting promotion budgets which would make comparisons difficult. The same could be said for including data such as cost-per-call and cost compared with level of service.

Bearing in mind the current reports received from service providers or external evaluators, workgroup members were asked to comment on the data elements that are most useful to their work and how these data are used. Critical data elements noted by workgroup members as well as two additional states fall into the following five categories:

<u>Reach</u>
- Who is calling? age, race, ethnicity, income, gender, insurance status (and insurance plan), type of tobacco use, pregnancy status,
- How many are calling?

<u>Outcomes</u>
- 30-day quit rates

<u>Operations</u>
- Live call answer rates
- Average wait times
- Abandonment rates
- Number of inquiries; intakes; counseling sessions
- Number of registered callers
- Enrollments into single call and multiple call programs
- Calls completed
- NRT shipments
- Fax Referral data

<u>Budget</u>
- Balance of funds remaining for NRT delivery

<u>Promotion</u>
- How heard about?

> *"...How many people called the quitline (good reach)? How many were tobacco users wanting to quit (good reach, effective messaging)? Did they have insurance (are we serving the most needy)? Do they have Medicaid (how can we utilize our Medicaid benefits in the state)? What was their ethnicity/race (are we having an appropriate reach)? Did they request the 5 or 1-call option (are they opting for the most effective program)? Did they request medication and if so, which one (can we afford it)? Are they pregnant and using the pregnancy program (are we getting the message out)? What county are they from (are we equitable)?"*
>
> *- Workgroup member*

Workgroup members use these data to:
- Track utilization
- Assess quality of reach into specific populations
- Assess impact of promotions
- Communicate to various audiences
- Improve outreach
- Adjust technical assistance and training to grantees and partners
- Plan for future efforts
- Validate invoice from service provider before payment is made

Workgroup members are pleased with the current data they receive and encourage access to "backend" data (i.e., length of call, counselor assigned and number of attempts to reach). However, access to data related to treatment is limited. According to one workgroup member it is hard to clearly identify the number of unique individuals who receive different types of service. One state plans to begin collecting data on additional chronic conditions soon and will begin collecting mental health data in the future.

What data should be gathered in order to answer those questions?

In early conversations with workgroup members the degree to which a national data warehouse would need to go far beyond the collection of MDS data remained unclear. Workgroup members agree that if states were to only pool MDS intake and follow-up data and the NAQC recommended standard measurement for reach and quit rates there would be ample data to make some very important statements about quitlines. While there is not yet full, standardized implementation of MDS across quitlines in the U.S., workgroup members agreed that in order to be useful the data warehouse does not need to achieve 100% participation immediately at its beginning.

As the group continued to discuss the full breadth of possibilities for the types of answers a national data warehouse might provide, the need for intervention-level data in addition to intake and follow-up data became clear. This is especially true if states are to

use the warehouse to inform programmatic decision-making such as targeting specific communities with tailored services.

Workgroup members want to be certain that the warehouse would not collect data for the sake of collecting data. To this end, the workgroup noted the importance of ensuring that CDC pay attention to the issue of redundancy/duplication when defining the data elements for the national warehouse. While MDS is likely to be the basis for the data set of the national warehouse, it is limited. In order to be most useful additional data will need to be gathered.

In conversations with a few states CDC learned that there would be less comfort with providing a national warehouse with individual level data than there would be with providing aggregated data. Data quickly become less useful when aggregated and the workgroup agrees that in order to achieve the goals they are proposing for the warehouse, individual level data must be gathered.

Who Should Have Access to the Warehouse?

Workgroup members believe that a discussion about who should have access to the data warehouse is needed and yet believe that defining the warehouse's data elements and the types of reporting and querying available must be done first. Members did have concerns about access and these concerns must be addressed if implementation is to move forward.

Members do believe that open access would be beneficial, allowing us to learn more by sharing more. However, assurances related to anonymity and appropriate use of data and/or reports generated by the warehouse are necessary.

Access concerns of workgroup members center around two possibilities:

1. *People would misinterpret the data and/or would not fully understand the importance of context when interpreting quitline data.* For example, if the data warehouse is promoted as a place to learn how one quitline is doing compared to other quitlines, the issue of "context" must be addressed. Participant, clinical and program characteristics vary widely across quitlines and therefore quitline outcome data must be interpreted carefully.

2. *People would report the data in hopes of encouraging increased support and there would be unintended outcomes or "friendly fire".* For example, a report card ranking states on their quitline call volume is generated and State X receives an "F." The goal of the report is to motivate legislators to provide more funding in hopes of improving the grade next time. However the "F" has the opposite effect – legislators believe that State X is not making good use of the current funds so redirects funding to another program.

Based on the discussion, there is a need to further clarify or define what we are talking about access *to*. For instance, if the data warehouse is generating standard or "canned" reports on a semi-annual basis (thus the data are presented in aggregate form) that may allow for the broadest level of access. Reports could be shared openly based on data-sharing agreements between the warehouse and each state. In this case, there may be a state that requires review of the report before being made public.

However, if the data warehouse is also allowing for the querying of individual-level data by individuals (again, results reported only in aggregate form), use of this function should have tighter controls to access. The same would hold true for individuals requesting access to a particular individual-level data set. In these cases, the workgroup recommends access be controlled using a body of "gatekeepers." One workgroup member endorsed a process similar to that currently being used by NAQC to filter requests for NAQC Annual Survey of Quitlines data: if a person wants access to the data they make a formal request; the request is reviewed by a subcommittee of the Research and Evaluation Workgroup based on clearly defined criteria; the request is either granted or denied.

One workgroup member recommends a phased-in approach to access. For example, in the first year of the national data warehouse only state tobacco control staff would have access. This would allow state-level staff to become more familiar with the data, with the reports generated with the data and any querying functions, if available.

Lastly, workgroup members noted concern that a national data warehouse might be subject to public information requests, especially if CDC/OSH is to serve as the warehouse. Clarity on this issue is still needed and recommended as critical information to share up-front with state-level staff as the national data warehouse process moves forward.

The Timing and Transfer of Data to the Warehouse

Considering that one of the most important goals in the implementation of a national warehouse is to minimize burden on the states, gaining the workgroup's perspective on the timing and transfer of data was imperative. However, what became clear about raw client-level data in this particular discussion is the degree of variation among states:

- Whether or not states currently receive raw data from their service provider;
- If they do, how often they receive it; and
- When the receive it, the format it is in.

How often do states receive raw data from their service providers currently and how often should the data be transferred to a data warehouse?

For the workgroup members who currently receive raw data from their service provider, the majority of them receive it monthly. Most of the raw data that is received goes directly from the service provider to either a 3rd-party evaluator or state-level evaluation/epidemiology staff. Two workgroup members receive raw data once a year, although they receive reports generated from those data more frequently.

Workgroup members were most concerned about those states that do not currently receive any raw data from their service providers. Members noted the degree of time and effort it took to contractually and technically work out details with their service providers in order to receive raw client-level data. Having a clear sense of the number of states that would need to "start from scratch" is essential to building a reasonable implementation timeline for a national warehouse.

Workgroup members believe that transferring data to the warehouse every month would be reasonable. However, there are workgroup members who want to know what kinds of reports they would be looking at first to determine an appropriate time frame for transferring data. For instance in order to see the impact on call volume or reach due to a federal tax increase, monthly transfer of data would be useful. However in order to see trends in utilization over time, semi-annual transfer of data would be sufficient. The required time frame for data transfer must be justified and must not place an undue burden on those who are sending AND receiving the data.

> *"What we need here is a matrix that looks at who would be using the data and for what purpose and how often they would need to look at it. That kind of matrix would help to get a better idea of when we needed to transfer data."*
>
> *~ Workgroup member*

While the issue of when the data should be transferred and the issue of who transfers it are important, the most important discussion according to workgroup members is HOW the data needs to be structured before transferring it. It is critical for the warehouse to dictate how data should be structured before states/providers start sending it so they are not left with the job off disentangling the varied data they receive.

> *"You could have 22 states that want to participate with 15 different definitions for education level for example. Someone has to sit down and code these 15 definitions in a standard way, align response categories...which means you could lose valuable information and it could also make things even more confusing. Someone has to take this job on...either the warehouse or the service providers."*
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> *~ Workgroup member*

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Ultimately there would be considerable cost to service providers associated with getting the data into the shape the warehouse requires. Guidance from the warehouse on the format is critical from the beginning and workgroup members believe that over time states will get used to providing required data in the format the warehouse needs it in. However, the "ideal" format should be defined collaboratively and with great detail and implementation viewed as a process.

> *"We spent a huge amount of time to get our database clean. If people aren't at that place they will have to spend a lot of time cleaning their data, setting up uniform data coding, putting the data in a format so that it can be delivered in a flat file...these are big mountains to climb."*
>   *- Workgroup member*

The workgroup did offer some guidance related to whether or not the warehouse should gather historical or future data. While for some historical data may be more difficult to access, the group believed that having one or two years of historical data would be beneficial.

Potential Barriers and Challenges

There are several significant barriers to successful implementation of a national data warehouse to be addressed and overcome if the benefits identified above are to be realized by the quitline community. Challenges are political, legal, financial and technical in nature.

Political Barriers

Political barriers are those that involve lack of political or public acceptance of an initiative and/or boundaries imposed by internal or external groups which would influence the effectiveness of an initiative. The workgroup discussed several possible political barriers to implementation of a national database including:

CDC as "the warehouse"

Workgroup members mentioned several times that having CDC behind this effort would increase participation by states – and that hopefully CDC involvement would mean long-term, sustainable funding. Not one workgroup member noted concern or hesitation about CDC acting as "the warehouse." Even the workgroup members who feel some hesitation around a national data warehouse understand the importance of money and credibility to its success.

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> *"I think that a lynch pin here is the CDC role. I think that having them helps make states feel more comfortable versus the data warehouse being a short-term NIH funded study. But even with their involvement, I am wondering if they will have to flex some muscle in order get the data."*
> *~Workgroup member*

However, three issues need clarification in order to increase comfort and trust with CDC serving in this capacity:

- Who would serve as gatekeepers to the data? (e.g., would CDC develop a committee of quitline community members to review requests for data or would they simply run the process internally?)
- Is data that goes to a CDC warehouse subject to public information requests?
- Would CDC have to abide by the same review process if they wanted access to the data to run their own reports?

Institutional/Legal Barriers

These types of barriers include lack of legal power to implement a particular initiative and/or legal/programmatic responsibilities which are split between agencies thus limiting the ability to implement an initiative solely on one's own. Potential institutional barriers to the national data warehouse include:

QL providers themselves may be reluctant to share the data.
This barrier goes beyond the technical challenges as workgroup members believe that some service providers may roadblock the process to obtain raw data due to the current competitiveness in the field. Some quitlines are still self-evaluated so there may be hesitation when service providers are asked to turn data over to a third-party for the first time.

IRB approval needed
One barrier to reporting client-level data will be for university-based service providers as IRB approval for the release of these data is required.

State processes to enact data-sharing agreements
There is a great degree of variation among states in how they would go about seeking approval to share data in a data warehouse. Additionally, there is variation in state-level staff awareness of required approval processes.

Financial Barriers

Financial barriers to the development, implementation and use of a data warehouse seem obvious and yet details related to the financial burden on states and service providers are somewhat unknown at this time. Workgroup members believe that communicating where the money to build and maintain a data warehouse is coming from is imperative and note that costs obviously go beyond the initial funding needed to create the infrastructure. Workgroup members recommend establishing a clearer understanding of the potential costs to service providers as well.

Technical Barriers

While workgroup members were better able to provide guidance related to the political, institutional and financial barriers, there are obvious practical, technical barriers that exist. Technical challenges include those that occur between the warehouse user and the warehouse; the warehouse and the service providers trying to transfer data and other issues related to the actual collection and transfer of data.

Some states already have access to their raw data from their service provider and others receive incredibly detailed monthly, quarterly and annual reports. In fact, the ability to provide customized reports and detailed summaries of utilization and outcomes has become a competitive advantage for some service providers. If one objective of a national data warehouse is to provide decision-making support for quitlines a data warehouse must be able to capture the data, clean it, and deliver it in a useful format and within a useful timeframe.

Strategies and Recommendations for Further Engaging States

After over six hours of discussion and several subsequent conversations with individual workgroup members recommendations for how to proceed with a process to engage more states in the discussion of a national quitline data warehouse emerged. These recommendations highlight the need for more detail, more process and more education.

Recommendations related to client-level data access and transmission

1. Outline potential costs for the warehouse and potential costs for service providers to clean and deliver data files periodically

2. Encourage service providers to share their processes for extracting data with one another in order to save time and effort

3. Assess which states currently have access to their raw data and how often they receive it

4. Understand which states do not currently have access to their raw data and why not

Recommendations related to building support for a data warehouse

1. Workgroup members agree that in order to successfully implement a data warehouse the benefits of participation must be very clear. Develop written scenarios that:
   a. explain by example how the data warehouse will benefit states individually and collectively;
   b. provide guidance on appropriate uses of the data warehouse as well as noting the types of questions or issues that it will not address; and
   c. provide different scenarios for well-funded states/those with current access to their data and for less-funded states/ those without current access to their data.

2. Look to other fields that have developed and implemented a data warehouse for guidance on how best to resolve many of the challenges noted above including:
    a. Data sharing agreements
    b. Whether or not warehouse is subject to public information requests
    c. Negative impacts of full-open access to the data
    d. For current national warehouses, the numbers and types of data requests received (to determine if the fear of open access is justified)

3. Develop a "dummy" warehouse available as an example during the planning phase rather than only talking about a warehouse in the abstract. Folks don't know what they don't yet know. In other words, until people begin to work with the data and gain an understanding of how the data appears and can be used in a warehouse, there will be hesitation and even road-blocking. For those with limited comfort with technology this may be especially true.

Recommendations related to encouraging use of a data warehouse

1. Develop matrix that outlines potential users; why they would use it; and when they would need to use it

2. Develop use examples for state funders, quitlines, CDC and other national partners, and sub-state (i.e., county) tobacco control programs and a matrix of questions by data element needed, indicating what is presently available and what would need to be collected.

3. Develop an "advisory council" tasked with detailing use of the data to be gathered in the warehouse (this group could also be responsible for sharing new ideas on how they are using the data warehouse)

4. Technical assistance and training to those with access to the data warehouse is also critical. Technical assistance and training should encourage use of the data warehouse as well as how to properly analyze the data stored there.

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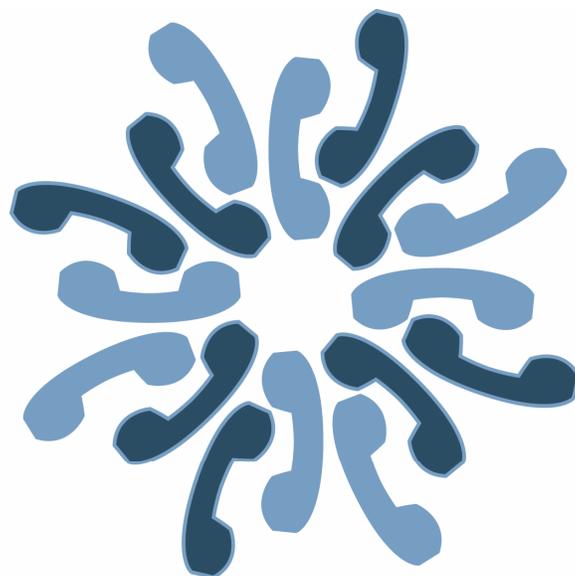
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