Protecting Communities Through Improved Public Health Information Systems

The Minnesota Public Health Information Network

Report to the Minnesota Legislature 2007

Minnesota Department of Health

January 29, 2007

Commissioner's Office
P.O. Box 64975
St. Paul, MN, 55164-0975
651-201-5000
www.health.state.mn.us/e-health

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Protecting, maintaining and improving the health of all Minnesotans

January 29, 2007

Dear Minnesota Legislators:

The attached report, *Protecting Communities Through Improved Public Health Information System—The Minnesota Public Health Information Network,* identifies the critical issues, challenges and opportunities of upgrading state and local public health data management systems.

The vision for the Minnesota Public Health Information Network (MN-PHIN) is to ensure the availability of timely and accurate information needed by public health professionals, policymakers, and community partners to:

- Efficiently and effectively respond to community health threats.
- Protect the public from serious but preventable diseases or injury.
- Carry out their responsibilities to make Minnesota communities healthier places to live.

MN-PHIN will also seek to improve how consumers access the public health and prevention information they need to make wise health decisions.

The Minnesota Public Health Information Network is a critical component of the larger Minnesota e-Health Initiative, a statewide public-private collaboration whose aim is to accelerate the use of health information technology to improve the quality, safety, and cost of health care.

We are very encouraged by the enthusiasm and commitment of state and local staff working collaboratively to address these critical and complex issues. I want to acknowledge Karen Zeleznak, Public Health Administrator, Bloomington Division of Public Health, and Dr. Martin LaVenture, Director, MDH Center for Health Informatics, as co-Chairs of the Steering Committee, as well as, all the members of the Steering Committee for their commitment and contributions. Their continuing work will address closing the technology gap for disease surveillance systems, increasing the informatics capacity of the public health workforce, and reducing the public and private health information technology gap in Minnesota.

The Governor's budget proposals for an Interconnected Electronic Health Records System and for Disease Surveillance Modernization are supportive of the recommendations contained in this report.

Please direct any questions about this report to Dr. Martin LaVenture at (651) 201-5950.

Sincerely,

Dianne Mandernach

Dianne M. Mandernach
Commissioner
P.O. Box 64975
St. Paul, MN 55164-0975

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Protecting Communities Through Improved Public Health Information Systems

The Minnesota Public Health Information Network

January 29, 2007

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"MN-PHIN will improve and protect the community's health by modernizing how public health agencies collect, exchange and act on information."

Karen Zeleznak, MS, MPH, Public Health Administrator,
Bloomington Division of Public Health,
MN-PHIN Steering Committee Co-Chair

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Executive Summary

The Minnesota Public Health Information Network (MN-PHIN) was created by the 2005 Minnesota Legislature to improve and protect the health of Minnesotans through the strategic application and management of health information systems. The MN-PHIN initiative seeks to ensure that state and local health departments have the information systems, policies and technical expertise necessary to meet their mission, not only in the face of growing public health threats but as a critical partner in the Minnesota e-Health Initiative. Public health is one of the four domains included in both the state and national e-Health initiatives.

The state-local Steering Committee for MN-PHIN has identified three overall strategies:

Interconnect. Ensure public health departments can electronically and securely exchange health information by adopting national and state data standards.

Integrate. Create more uniformity across public health information systems by defining the fundamental work of public health in ways that ensure new and existing information systems effectively support that work.

Inform. Use health information in more effective, efficient and integrated ways to improve services for the individuals, families and communities served by public health.

While crucial groundwork has been laid in the past two years, the MN-PHIN initiative must ensure that public health agencies can meet the challenges and opportunities of the e-Health transformation:

1. Improving how information systems support efficient and effective services to consumers.
2. Closing the technology gap between the governmental public health and the private health care sector.
3. Adopting national and state data standards to enable secure and electronic exchange of data and to integrate information systems.
4. Training the public health workforce in the informatics skills and principles necessary to build and use information systems effectively.

The Governor's Budget Proposals

In support of the activities and recommendations of the Minnesota Public Health Information Network, the Governor has proposed funding for a Health Care Access Fund appropriation of $500,000 in FY 2008 and $250,000 in FY 2009 and 2010 for investments in health information technology to modernize local health department information systems and to strengthen and improve public health in Minnesota. This proposal:

- Supports implementation of the Minnesota Public Health Information Network initiative to update local health department systems.
- Supports technical assistance to grantees and local health departments.
- Supports interoperability with other e-Health Initiatives statewide.

In further support of the recommendations found in this report, the Governor also proposes a Health Care Access Fund appropriation of $2 million per year to develop and implement an integrated statewide surveillance system that will comply with emerging national standards and requirements. The

new system will improve the detection and response to bio-terrorism events, disease outbreaks such as pandemic flu, and trends in chronic diseases such as cancer and diabetes. The Governor's proposal complements his e-Health proposal by enabling the Minnesota Department of Health (MDH) to exchange data securely and electronically with partners who are investing in electronic health information technology.

The Governor's budget proposals and the strategies and activities of this report are based on the findings and recommendations of the MN-PHIN Steering Committee, as endorsed by the State Community Health Services Advisory Committee.

Recommendations to the Legislature for Action

The Commissioner of Health recommends that the 2007 Minnesota Legislature provide funding, consistent with the Governor's budget, to support the MN-PHIN activities outlined in this report. Funding in support of these initiatives will lead to effective action in modernizing public health information systems by:

1. Reducing the growing public-private technology gap by modernizing current information systems to securely exchange infectious disease and other health data with private providers.
2. Addressing the shortage of trained state and local public health informaticists by collaborating with post-secondary institutions to develop informatics courses specifically designed for practicing public health professionals.
3. Coordinating, supporting and evaluating the above activities by ensuring adequate public health informatics expertise exists at MDH and is readily available to local health departments and MDH programs.

Background

The Minnesota Public Health Information Network (MN-PHIN) was created by the 2005 Minnesota Legislature to improve and protect the health of Minnesotans through the strategic application and management of health information systems. The MN-PHIN initiative seeks to ensure that state and local health departments have the information systems, policies and technical expertise necessary to meet their mission, not only in the face of growing public health threats but as a critical partner in the Minnesota e-Health Initiative. Public health is one of the four domains included in both the state and national e-Health initiatives.

MN-PHIN will improve and protect the community's health by improving how public health agencies collect, exchange and act on information.

The state-local Steering Committee for MN-PHIN has identified on three overall and key strategies:

> ***Interconnect.*** Ensure public health departments can electronically and securely exchange health information by adopting national and state data standards.
>
> ***Integrate.*** Create more uniformity across public health information systems by defining the fundamental work of public health in ways that ensure new and existing information systems effectively support that work.
>
> ***Inform.*** Use health information in more effective, efficient and integrated ways to improve services for the individuals, families and communities served by public health.

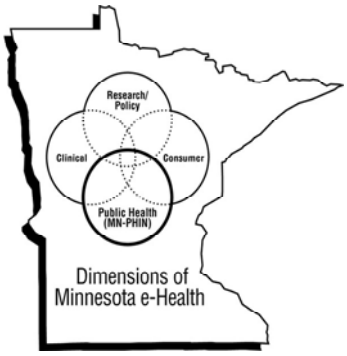
MN-PHIN will improve the design and function of public health information systems, as well as create the policies and the skilled workforce to improve the collection, management, uses and exchange of timely and accurate data.

Based on the 2005 enabling legislation, an Interim Advisory Committee of state and local public health staff formed to create a vision for MN-PHIN, and to develop recommendations for launching and focusing the initiative (see Attachment A). A summary of Interim Advisory Committee accomplishments was included in the *2005 MN-PHIN Report to the Legislature*[1].

The recommended joint state-local governance structure was established in February of 2006, and a specific workplan established to initiate projects that were less dependent upon state funding (see Attachment A for a workplan summary).

The recommendations to the 2007 Minnesota Legislature found later in this Report build on that groundwork to continue progress on this critical initiative

[1] www.health.state.mn.us/e-health/mnphin



MN-PHIN as Part of Minnesota e-Health

Of paramount importance to MN-PHIN is to be actively engaged with—and contributing to—the Minnesota e-Health Initiative. Public health is one of the four domains included in both the Minnesota and national e-Health initiatives. In Minnesota to date, these connections have been achieved through:

One of the initial e-Health recommendations to the 2007 Legislature[2] is focused on advancing public health and specifically calls for legislative support of MN-PHIN:

"Improve population health and protect communities through accessible prevention resources, widespread knowledge of community risks, and rapid detection of and response to public health threats, including to:

- Improve the timely detection and electronic reporting of diseases to public health authorities, with the timely return of information on community risks and threats.
- **Create and support an integrated state-local Minnesota Public Health Information Network (MN-PHIN) for timely detection of and response to infectious disease and other emergencies."**

Other e-Health recommendations related to public health goals as well, particularly those around improving continuity of care for those with chronic diseases, and improving immunization coverage by fully integrating the statewide immunization information system with electronic medical record. Other examples of the connection between MN-PHIN and the e-Health Initiative include:

- Created a Population/Public Health track at the 2006 e-Health Summit, focusing on how Electronic Health Records can contribute to improvements in population health goals.
- Focused an entire e-Health Advisory Committee meeting (April 2006) on public health issues, which culminated in the recommendation cited above.
- Ensured local health departments were eligible to be part of the community e-Health collaboratives required by the 2006-2007 e-Health grant program[3] authorized by the Legislature.

Interconnect

Retool public health information systems so they can electronically exchange data with health care providers.

Integrate

Merge data and information systems to improve our understanding of an individual's, family's, or community's health status.

Inform

Make personalized prevention and public health information more readily available to consumers.

[2] www.health.state.mn.us/e-health
[3] *ibid.*

The figure in Attachment B shows how the governance, relationships and activities of MN-PHIN fit with e-Health and other initiatives. MN-PHIN will continue to identify ways to contribute to—and gain from—the Minnesota e-Health Initiative.

Critical Issues

While crucial groundwork has been laid in the first year of the MN-PHIN initiative, the challenge of ensuring that public health is keeping up in the information age remains daunting. These challenges exist primarily in four areas:

1. Improving how information systems support efficient and effective services to consumers.
2. Closing the technology gap between the governmental public health and the private health care sector.
3. Adopting national and state data standards to enable secure and electronic exchange of data and to integrate information systems.
4. Training the public health workforce in the informatics skills and principles necessary to build and use information systems effectively.

Consumer Services.

While the hundreds of separate, "silo" public health information systems perform well for the tasks they were built to carry out, their inability to work together means consumers must provide the same information multiple times as they access different services. It also creates significant inefficiencies in coordinating services across multiple health and social services programs. Both businesses and consumers expect and need accurate, timely and useful information from government. Consumers expect government to be "in the know" just as much as the other businesses they interact with.

Closing the Health Information Technology Gap.

A critical concern is the growing technology gap between private health care and governmental public health. **Public health is lagging behind in delivering the commodity that the private sector most looks to government for—information. Millions of dollars are being spent in Minnesota to implement electronic health records (EHRs) in hospitals and clinics.** The current inability to routinely exchange data electronically with public health is rapidly becoming a major frustration for these health care organizations. Public health needs to update and expand the functions of its information systems so they can readily and securely exchange electronic information with EHRs. This is critical for two reasons:

- On a routine basis, clinical information on individuals

Public health is lagging behind in delivering the commodity that the private sector most looks to government for—information.

Public health information systems must be rapidly modernized to keep up with the momentous changes occurring in health information technology and exchange.

Clearly public health has made considerable progress in its use of information and information systems. The nationwide disease outbreak from Schwann's ice cream in the mid-1990's took weeks to detect and source, while the recent spinach contamination was confirmed within days.

But the hundreds of stand-alone systems that cannot exchange data means that public health still has along way to go to achieve the level of efficiency and timeliness that the public expects and deserves.

receiving health care from local health departments needs to be exchanged with their primary care physicians to deliver safe and high quality care.

- In the case of public health emergencies such as pandemic influenza, health data needs to be transmitted rapidly among health organizations, as well as among emergency preparedness units of local, state and federal government.

Adopting National Data Standards.

With the release of national standards for health data, a process that began in 2006 and will continue for several years, MDH and local health departments now must quickly assess which systems need to adopt which standards—an initiative that will require considerable effort to develop, test and implement. Public health information systems must be rapidly re-tooled to become more standards-based, especially around terminology standards (e.g., the coding of laboratory results) and messaging standards (so that the information systems know what incoming data actually means and what to do with it).

Related to national health care data standards are the emerging national Public Health Information Network (PHIN) standards, focused primarily around emergency preparedness and response. These standards must be included in existing and new public health information system to meet certification requirements of the national Centers for Disease Control and Prevention.

Adopting data standards will also help ensure information systems work together more effectively to ensure consistent, integrated and appropriate care or other services. It will enable systems to merge data from disparate sources to better assess community health status and risks. Creating greater consistency and interoperability across information systems will enhance the efficiency, technical support, management and use the health information systems.

Workforce Training in Informatics.

The third priority area is the critical need to train public health staff in the informatics knowledge and skills necessary to guide the described work. We need to rapidly create informatics education curriculum for the current and future public health workforce. This is also a challenge for the private healthcare sector: Informatics courses are emerging at post-secondary institutions for students coming into health-related careers, but little exists for the current workforce, many for whom are not

computer savvy. MN-PHIN will be partnering with universities to adapt and develop training modules specifically focused on increasing informatics knowledge and skills in the practicing workforce.

MN-PHIN Activities to Address Critical Issues

Based on the recommendations from the initial Interim Advisory Committee, an ongoing 15-member Steering Committee was formed in February 2006, consisting of six representatives from various sized and geographically located local health departments, six members from various MDH programs, and one representative from the Department of Human Services.

Action began immediately to develop and implement a workplan aimed at achieving the recommendations, gaps and needs. The four key elements of the workplan (found in more detail in attachment A) are:

- *Support* information system projects of state and local importance.
- *Promote* the adoption of data standards so information systems can securely and meaningfully exchange health information.
- *Communicate* knowledge, information and best practices assess and build informatics capacity.
- *Engage* key partners in advancing the strategic application and management of public health information systems.

Key progress was made on all seven original 2005 recommendations for MN-PHIN:

- *Establish joint state-local governance*
- *Identify policy reform*
- *Adopt data standards*
- *Establish uniform policies*
- *Improve and integrate applications*
- *Provide training*
- *Implement MN-PHIN as an integral part of MN e-Health*

The accomplishments to date, organized by the original MN-PHIN recommendations reported to the 2005 Legislature, included:

Establish a joint state-local governance structure that has authority and funding to define systems requirements and establish performance measures and accountability.
The state-local MN-PHIN Steering Committee was formally chartered in February 2006 and developed the workplan that guided the subsequent achievements.

Identify policy reform needed to implement and integrate information systems, stimulate capitol investment and ensure sustainability.
A number of statewide and MDH-wide assessments have identified the major issues, challenges and costs for upgrading and/or designing information systems that can exchange data with health care providers. A major challenge is the sheer number of "silo" information systems that must be upgraded in order to work together better.

Adopt national data and technical standards, and define processes that ensure ongoing, seamless interconnections among partners.
Given the importance of data standards and the lack of understanding about them, MN-PHIN created a new educational module on Public Health Data Standards (see Attachment E). This primer highlights the importance of data standards in everyday work, in designing information systems, and as a critical component in health information exchange.

Establish uniform policies and practices to protect the confidentiality and security of health information.
The findings and recommendations from the Minnesota Privacy and Security Project (www.health.state.mn.us/e-health/mpsp) will have important implications for public health information systems. MN-PHIN is monitoring the project and will consider how to best implement the privacy and security provisions of the project.

Improve and integrate software applications that support the local public health essential activities and statewide public health programs.
MN-PHIN creates a venue for state and local health departments to jointly guide information system development. The first such example is the Environmental Health Knowledge Management Project—a state-local initiative to create a comprehensive set of data standards for environmental health that, when used in purchasing or developing information systems, will ensure interoperability between state and local programs. Work has also begun in examining how the numerous child health information systems can be made to work together. Such foundational work significantly improves the ability to efficiently, rapidly and securely exchange information when needed to improve the health of individuals and communities.

Most recently, MN-PHIN secured a three-year, $600,000 *Common Ground* grant, from the Robert Wood Johnson Foundation, to work with other states on identifying the basic business processes for chronic disease information systems so they can be built with greater standardization and more effective features.

Provide training for public health leaders and staff in the core competencies of public health informatics.
An early step for MN-PHIN was to assess the state of local public health informatics through a statewide survey followed by in-depth interviews with eleven local health departments. The findings were summarized in a report entitled, *Public Health Information Systems in Minnesota—The Uses and Hopes Among Local Public Health Staff* (see Attachment C) which included recommendations in three areas:

- People and skills (workforce capacity): Identify and support local and state staff in developing informatics expertise.
- Leadership and organizational action: Provide leadership to increase organizational capacity in informatics within and between all LHDs and MDH.
- Learning through sharing solutions: Create an effective system of peer learning through an active network of newly emerging cadre of staff learning informatics principles and practices.

MN-PHIN also developed a framework and assessment tool for measuring informatics capacity over time known as the *Informatics Profiles*. Assessing the informatics capacity and needs across all local agencies and MDH programs will inform MN-PHIN capacity building activities. The assessment is a groundbreaking initiative nationally, and is of interest to many other states. See Attachment D for a graphical presentation of the *Profiles*.

Another major undertaking of the MN-PHIN Steering Committee in its first year was to create what it terms a *Community of Practice*[4]—providing the forum and the opportunities for local and state staff to share knowledge and experience, and to work collaboratively on data projects. The concept of a Community of Practice grew out of the identified needs and the recommendations from the eleven agency interviews conducted in 2005, as well as out of experience nationally with similar knowledge-sharing "communities." The benefits to members include having access to knowledge, advocacy and other forms of support (e.g., sample project and communications plans, charters, data flow diagrams, report templates, data dictionaries, and other sample documents). Such knowledge and tested samples can lead to an improved project planning and implementation, with reduced risks and higher chances of success.

Implement MN-PHIN as an integral part of the Minnesota e-Health Initiative.
Actions based on this recommendation were addressed in the section "MN-PHIN as Part of e-Health." In addition, MN-PHIN successfully secured a one-year, $100,000 *InformationLinks* grant from the Robert Wood Johnson Foundation, aimed at ensuring public health is part of health information exchanges. Minnesota is using the funds to support much of the work of MN-PHIN, especially the *Informatics Profiles*.

The Governor's Budget Proposals

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This proposal:

- Supports implementation of the Minnesota Public Health Information Network initiative to update local health department systems.
- Supports technical assistance to grantees and local health departments.
- Supports interoperability with other e-Health Initiatives statewide.

In further support of the recommendations found in this report, the Governor also proposes a Health Care Access Fund appropriation of $2 million per year to develop and implement an integrated statewide surveillance system that will comply with emerging national standards and requirements. The new system will improve the detection and response to bio-terrorism events, disease outbreaks such as pandemic flu, and trends in chronic diseases such as cancer and diabetes. The Governor's proposal complements his e-Health proposal by enabling the Minnesota Department of Health (MDH) to exchange data securely and electronically with partners who are investing in electronic health information technology.

[4] www.health.state.mn.us/e-health/mnphin

The Governor's budget proposals and the strategies and activities of this report are based on the findings and recommendations of the MN-PHIN Steering Committee, as endorsed by the State Community Health Services Advisory Committee.

Recommendations to the Legislature for Action

The Commissioner of Health recommends that the 2007 Minnesota Legislature provide funding, consistent with the Governor's budget, to support the MN-PHIN activities outlined in this report. Funding in support of these initiatives will lead to effective action in modernizing public health information systems. Specifically the funding will support the following three key strategies and their related activities:

1. Reduce the growing public-private technology gap by modernizing current systems to securely exchange infectious disease and other health data with private providers.
1a. Prepare detailed functional requirements and technical specifications for local health departments to meet essential services.
1b. Prepare detailed functional requirements and data and technical specifications for key Minnesota Department of Health information systems, such as communicable disease surveillance and reporting systems, child health information systems, environmental health, vital records, the MDH laboratory information management system, and others of most importance to local health departments and private health care organizations.
1c. Adopt data standards identified through the national Healthcare Information Technology Standards Panel, such that by 2010, at least 75% of state and local information systems have adopted relevant vocabulary and exchange standards.
1d. Implement relevant solutions for privacy and security as defined by the Minnesota Privacy and Security Project, in particular those related to authorization, access, authentication and auditing.
1e. Ensure local health departments have the technical capacity required to participate in emerging regional Health Information Exchanges.

2. Address the shortage of trained state and local public health informaticists by collaborating with post-secondary institutions to develop informatics courses specifically designed for practicing public health professionals.
2a. Collaborate with the University of Minnesota, the College of Saint Scholastica and other interested schools to develop continuing education programs in informatics for the current public health workforce.
2b. Evaluate the feasibility of a public health informatics certificate program through one or more universities, primarily using distance learning tools.
2c. Continue developing informatics education programs in schools that train current and future students in the health care and public health professions.

3. Coordinate, support and evaluate the above strategies by ensuring adequate public health informatics expertise exists at MDH and is readily available to local health departments

and MDH programs.
3a. Continue to support a process for identifying information system projects of highest priority for both state and local public health agencies.
3b. Ensure projects use appropriate and established informatics planning methods to help achieve successful results in information system design.
3c. Serve as a clearinghouse of informatics knowledge and experience so that projects can learn from one another and improve results over time.

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Attachments to the
2007 MN-PHIN Report to the Minnesota Legislature

Attachment A: MN-PHIN Roadmap and Summary of the 2006-2007 MN-PHIN Workplan

Attachment B: MN-PHIN Governance, Relationships and Activities

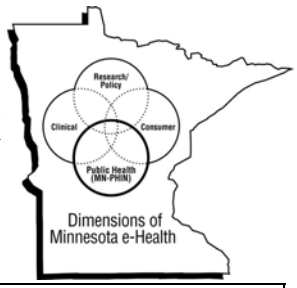
Attachment C: Public Health Information Systems in Minnesota

Attachment D: Graphic depiction of The Informatics Profiles

Attachment E: Public Health Data Standards—Improving How Public Health Collects, Exchanges and Uses Data

Attachment F: Consumer and Staff Benefits of MN-PHIN as Part of e-Health

Attachment A

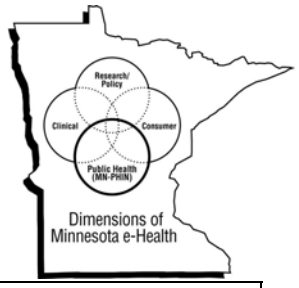


Minnesota Public Health Information Network **(MN-PHIN)**

Roadmap for Action

Goal	Improve the health of Minnesotans through the strategic application and management of health information.		
Vision	Create the infrastructure and policies that enable timely, accurate and statewide exchange of public health information. Such a network will enable public health professionals, policymakers, and community partners to: ➢ Respond efficiently and effectively to community health threats. ➢ Protect the public from serious but preventable diseases or injury. ➢ Carry out their responsibilities to make Minnesota communities healthier places to live. ➢ Enable consumers to access the public health and prevention information they need to make informed health decisions.		
Values	➢ Focused on the health of communities. ➢ Driven by community and state needs. ➢ Employs an incremental approach to achieving its vision. ➢ Leverages existing information systems and knowledge. ➢ Facilitates strategic development of new information systems. ➢ Supports electronic exchange of data. ➢ Safeguards confidentiality and security of information.		
Strategies	*INTEGRATE* information systems to support public health practice and prevention in all local public health departments and at MDH.	**INTERCONNECT** local, state, federal and key partners to support electronic exchange of information.	*INFORM* Make personalized prevention and public health information and knowledge available to consumers.
Recommendations (2004)	➢ Establish a joint state-local governance structure that has authority and funding to define systems requirements and establish performance measures and accountability. ➢ Identify policy reform needed to implement and integrate information systems, stimulate capitol investment and ensure sustainability. ➢ Adopt national data and technical standards, and define processes that ensure ongoing, seamless interconnections among partners. ➢ Establish uniform policies and practices to protect the confidentiality and security of health information. ➢ Improve and integrate software applications that support the local public health essential activities and statewide public health programs. ➢ Provide training for public health leaders and staff in the core competencies of public health informatics. ➢ Implement MN-PHIN as an integral part of the Minnesota e-Health Initiative.		

Minnesota Public Health Information Network (MN-PHIN) Steering Committee
Summary of 2006-2007 Workplan



Purpose	MN-PHIN will create the infrastructure, the policies and the skilled workforce to improve the collection, management, uses, and exchange of timely and accurate data, as well as improve the design, functions and interoperability of public health information systems.
Summary of Year One Workplan	*Support* information system projects of state and local importance ➢ *Identify* projects to become part of MN-PHIN and its community of practice. ➢ *Provide value* to selected projects through stakeholder engagement, project management support and best practices. *Promote* adoption of standards for interoperability and exchange ➢ *Identify* appropriate standards for adoption. ➢ *Identify* the current use of standards and barriers to increased adoption.* ➢ *Forge* consensus on which standards to adopt for Minnesota. ➢ *Implement and support* the uniform use of standards across all agencies and information systems. *Communicate* knowledge, information and best practices; assess and build informatics capacity ➢ *Assess* educational needs among state and local staff.* ➢ *Identify* preferred methods for training and knowledge sharing.* ➢ *Provide, coordinate and support* educational activities to develop competencies and build organizational capacity in public health informatics. *Engage* key partners in advancing the strategic application and management of public health information systems. ➢ Foster continual linkages between MN-PHIN and MN e-Health. ➢ Partner with DHS on integration and exchange issues. * Part of the *Informatics Profiles* being created for local agencies and MDH programs.
Current Members	LPH: Karen Zeleznak (Co-chair), Pat Adams, Ann Bjari, Sue Hedlund, Julie Myhre, Cathy Sandmann, Diane Thorson MDH: Martin LaVenture (Co-chair), Deb Burns, Keith Kearney, Jennifer Ellsworth, Aggie Leitheiser, Emily Peterson-Stauffer, John Stine DHS: Vicki Kunerth Staff: Bill Brand, bill.brand@health.state.mn.us, (651) 201-5508 Sara Hollie, sara.hollie@health.state.mn.us, (651) 201-5979

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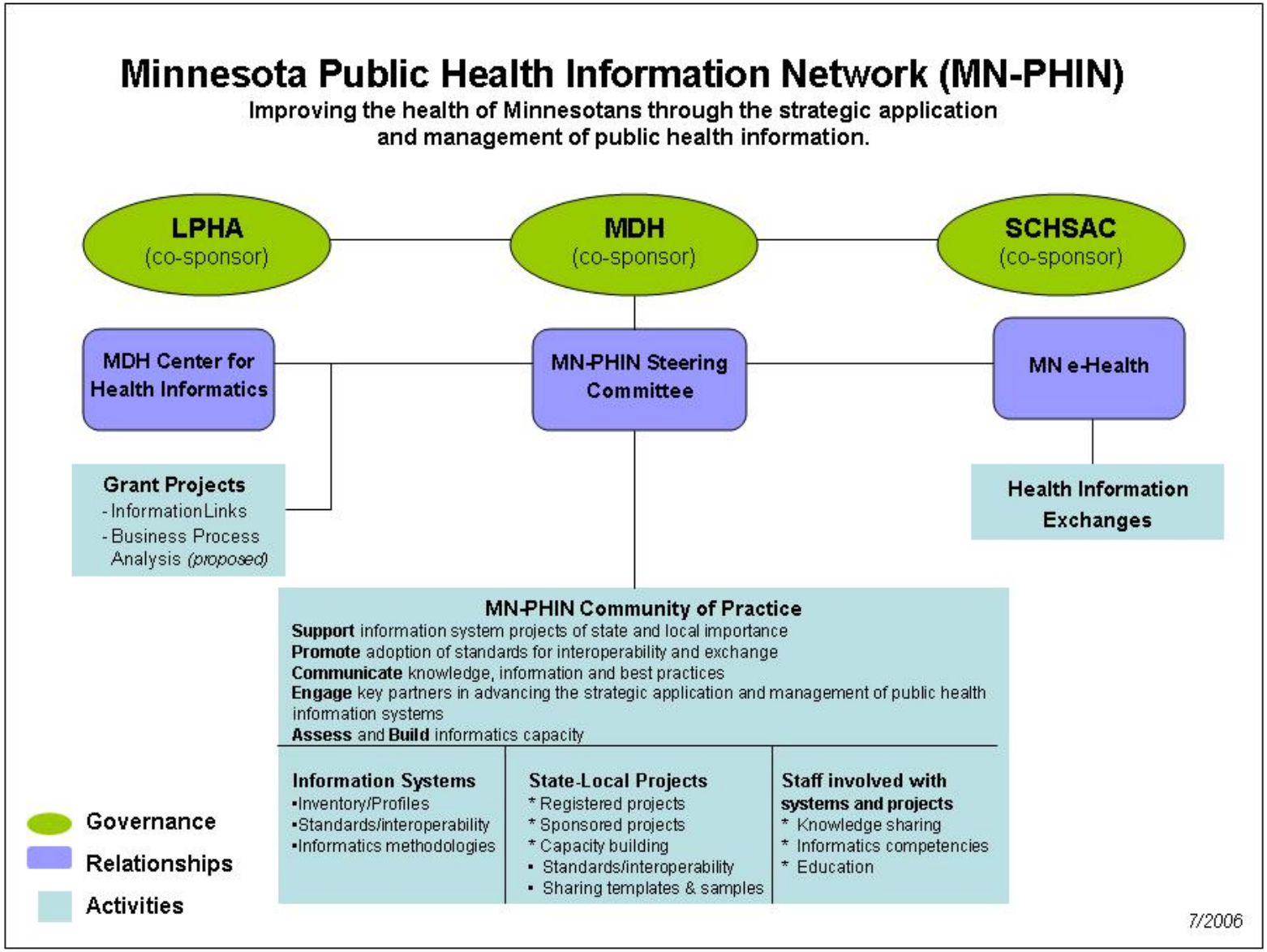
Attachment B



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Attachment C

Public Health Information Systems in Minnesota

The Uses and Hopes Among Local Public Health Staff

In the summer and fall of 2005, we traveled to eleven local public health agencies to interview directors and staff on the information systems they use every day. We wanted to know how those systems support—and sometimes hinder—effective public health management and practice. This is what they told us—their current frustrations but also their view of opportunities and dreams for information systems that would fully support them in their work.

Our great thanks to the staff of the eleven agencies that shared their stories and their vision for public health informatics in Minnesota.

Sandy Maczkiewski
Countryside Public Health

Lila Taft
Dakota County Public Health

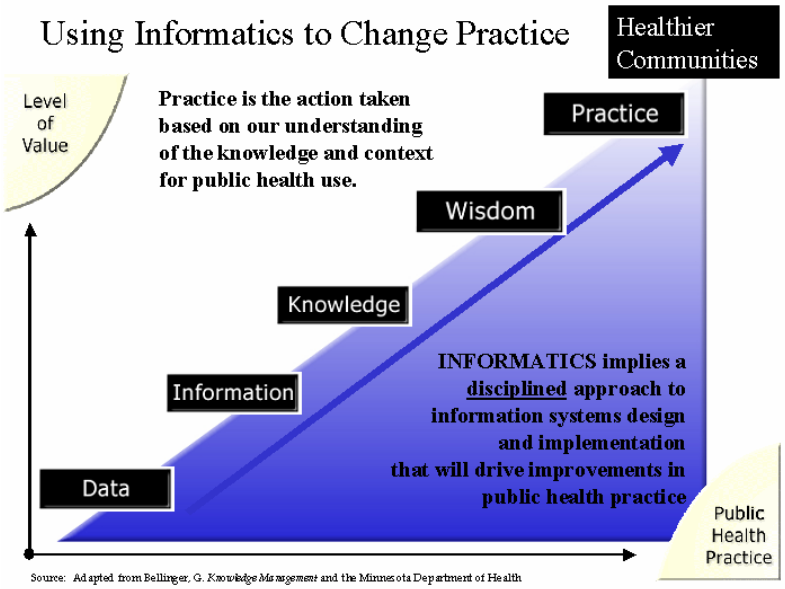
Information systems are critical to effective public health practice and management. They are the central tool we use to assess and protect the health status of our communities, to track our activities and evaluate their results, to record the health services we provide, and to manage the complex program and fiscal operations of our agencies.

Information systems are used extensively in local public health agencies in Minnesota; however, the large number, disparate design, and "silo" nature of these systems undermine their full benefit to staff. Inefficiencies and frustration result when each program uses its own information system, and when systems cannot readily exchange data or report data out in ways that are meaningful for local staff.

These separate information systems are often required by state agencies, whose interests are limited to their specific programs. But local public health has a much more integrated "person and family centric" view of program activities since many families receive a variety of services from the agency. The need to integrate the information processes related to those services is critical to efficient operations and essential to best serving individuals and families.

Why is it so critical to use information resources in a coordinated and integrated way? Because information is the key to gaining insight and developing practices that improve the health of our communities.

The diagram below depicts the "Informatics Incline" that shows how data leads to healthier communities. Data from various sources needs to be consolidated to get a holistic view of community health indicators (*Information*). We then add our Knowledge of the community—its risks and resiliencies—to gain the insights we need (*Wisdom*) for shaping our programs (*Practice*) in ways that positively impacts the health of our community.



When one of our public health nurses visited a client in her home—it happened to be on a Thursday—the woman said, "But my Tuesday nurse just did that." Here we had two nurses from two Family Health programs visiting the same household without knowing about the other. An integrated client database would have enabled us to avoid duplicating activities such as collecting data from the family.

Guy Peterson
St. Louis County
Health Department

Public Health Informatics is a new discipline focused on effective use of information systems in public health.

It is defined as the systematic application of information and computer science and technology to public health practice, research, and learning" (Yasnoff – 2001)

Today many of our information systems do not support going beyond the "information" stage, limiting opportunities for improving public health practice and the health of our communities.

Background

In 2005, Sandy Macziewski from Countryside Public Health and Lila Taft from Dakota County Public Health held face-to-face interviews with the directors and staff of eleven local public health agencies across the state (see agency list in Attachment A). The purpose of the interviews was to learn first-hand how information systems were currently used, where they were effective in supporting efficient agency programs and operations, and where they were not. The interviewers also wanted to hear the "dreams" that staff had for how information systems could work together to make work more efficient and to support public health practice.

These interviews represented a second phase of informatics assessment among local public health agencies. All local agencies completed a written survey in early 2005 that highlighted use of information systems, uncovered numerous concerns, such as unconnected disparate systems, and also identified potential opportunities for improvement (see findings in Appendix B). The subsequent interviews described here went into more depth with a sub-set of agencies in order to better understand the current problems and opportunities for improvement. The interviews sought to gain insight into establishing goals for improving public health information systems, as well as for developing a future, more comprehensive and ongoing agency-specific "informatics profile."

The findings from these Phase 2 interviews have been grouped into five main categories:

- Agency Management
- Program Planning and Management
- Efficiency
- Informatics Capacity
- Communication and Information Exchange

This report is a summary of those eleven interviews. The detail of the findings can be found in Appendix C.

Key Findings (successes, barriers, dreams)

Current Snapshot

- **Considerable progress has been made in the past 10 years in automating pubic health documentation and operations.** Partially integrated public health information systems that support electronic documentation are used in many agencies, with the initial development focusing on nursing documentation in home health care and family health.
- **Recently, these systems have been redesigned to capture information from other program areas,** including, disease prevention

and control, health promotion, environmental health, and various community-organizing activities.

- **However, for most agencies, a single client record that fully supports every program or service received by that client over time does not exist.** Current systems support individual program areas such as lead, immunizations, and primary clinic visits. Data must be entered separately on the same individual in numerous systems. This makes it difficult to easily obtain a complete picture of an individual's needs and services.
- **In most agencies there is no ability to link program data and information systems for billing, scheduling, accounting and dailies.** This leads to inefficiencies and potential loss of revenue.
- **The separate "silo" information systems make it difficult to support coordinated or effective services for clients.** Separate information systems support separate and uncoordinated decision making and service delivery.
- **It is challenging and often expensive to consolidate data to form a complete picture of the community's health status.** Improvements in community health are ultimately what we are responsible for but our current processes for measuring this are cumbersome, inefficient, expensive and often incomplete.

Key Strategies for the Future

- **Build understanding and support for the concept of "population health" and the important role of data.** Policymakers, health care providers, individual clients, and the general public must understand the need and value for using information to determine health trends in the population and develop strategies to improve the public's health.
- **Build understanding among public health staff for the importance of information in improving the community's health.** The success of public health information systems will depend in large part on a solid connection between data collection and purpose. The more staff understand how data can be used to support and drive programs and policies, the more supportive they will be of collecting accurate information, and the more interested they will be in using that knowledge to provide better services to clients and communities.
- **The success of public health information systems will be influenced by improved state and local communication and information exchange.** State and local public health staff need to understand the purpose and contribution of each other's information systems and what they contribute to improving public health. The activities of each may differ but the mission and purpose of both is to achieve defined health goals for the population. State and local program and information system staff must work together to maximize system design, data quality, and inter-operability (simply put, the ability to exchange data meaningfully between systems) which in turn will lead to improved services to clients, families and communities.

One of our biggest struggles is to gain access to our own information. Like many other agencies, we have "a ton" of free-standing systems, but as a joint human services and public health agency, the systems tend to have a human services bias to them – which doesn't necessarily fit for public health.

Sometimes databases seem like "black holes" -- you pour more and more data into them and nothing is able to make its way back out. If staff can obtain data and start to see how useful it can be, there is a glimmer of understanding that in turn creates demand for more information and the ability to use the data.

Staff from
Blue Earth County

A number of years ago we were excited to start receiving our county's birth certificate data on a weekly basis in an electronic format from MDH. We created a Microsoft Access database that we used to generate referrals to several family health programs.

Things moved along just fine for a number of years, until one day when a support staff person arrived in my cube to groan, "I can't get the data to run!" After investigation, I discovered that the some of the field names had been changed – sending me on an arduous trail of repair. Eventually we had to switch to Crystal Reports software to run our reports.

Better understanding of how partners use data and good communication process prior to change would have eased the transition and reduced many hours of work.

Lila Taft
Dakota County
Public Health

- **Data standards must be adopted for public health information systems.** A key to successful inter-operability of public health information systems is the adoption of uniform standards for data collection, storage, and exchange. Many national standards currently exist and more are being developed, but few support local public health needs for documentation and exchange of data. Agreement on which standards to use locally in Minnesota will be critical to successful exchange of data among other agencies and with health care providers. Agreements need to include policies and practices for implementing the standards

Observations on Exchange

- **Most of these findings relate to uses of information *within* a public health agency.** But this work will also lay the groundwork for exchange *across* agencies and with health care providers.
- **As we move ahead toward greater inter-operability of public health information systems, we need to have a clear picture of where we want to end up.** If we start with the end in mind, we can work backwards to figure out how we get there one successful step at a time. In other words, we need to plan broadly and with a clear vision but implement incrementally.

Recommendations

The overarching recommendation coming out of the interviews is to strengthen and expand state and local informatics capacity in order to better "bridge" public health programs and information technology. These "informatics bridges" can be between programs within local agencies, between local agencies and MDH, and between public health and private health care.

We've grouped the types of bridge-building recommendations into the three major areas of need that were identified through the interviews:

- People and skills (workforce capacity)
- Leadership and organizational action
- Learning through sharing solutions

Identify and support local and state staff who can develop informatics expertise.

Problem: There is a clear need to develop the people and other internal resources that can advance our approaches to collecting, managing, analyzing and acting on public health data. Increasing demands in an information society, and the increasing pressures around government accountability, require improved data-driven management and program practices.

Recommendations:

- Create a reporting element in the PPRMS system for identifying a staff informatics specialist within each agency. (Community & Family Health Division, MDH Center for Health Informatics)

- Under the sponsorship of the state-local MN-PHIN Steering Committee, develop resource materials listing the desired attributes, competencies, and sample job descriptions/duties for informatics staff.
- Work with other states and the CDC to develop public health informatics competencies (Center for Health Informatics with input from the MN-PHIN Steering Committee and the LPHA Informatics Committee).
- Develop strategies to adequately support these staff in their training, application of new skills, and sharing of knowledge with other agency staff. (State and local managers, Center for Health Informatics)

Provide leadership to increase organizational capacity in informatics within and between all LHDs and MDH.

Problem: The informatics capacity in Minnesota's public health agencies is very limited and needs to increase using a disciplined approach to information systems design and implementation that will drive improvements in public health practice.

Recommendations:

- Through the MN-PHIN Steering Committee, identify informatics goals for Minnesota that will improve our assessment capabilities and improve public health practice.
- Develop an "informatics profile" for each agency that will include contact information, current systems, special skills or competencies, previous or current efforts to collaborate or aid interoperability.
- Implement a comprehensive and modular training package based on the competencies that are readily available to any local or state staff person desiring to enhance their informatics knowledge and skills. (Center for Health Informatics with oversight from the MN-PHIN Steering Committee)
- Provide technical assistance to local staff on putting informatics principles into practice, through MDH program or regional informatics consultants.
- Provide leadership for joint informatics solutions between LHDs and MDH through the MN-PHIN Steering Committee.
- Establish a process within the MN-PHIN framework for LHDs and MDH to discuss and resolve common needs and requirements for information systems. (MN-PHIN Steering Committee)

Create an effective system of peer learning through an active network of informatics specialists

Problem: Opportunities for peer exchange of information and resources are very limited. There is insufficient coordination and support among informatics staff at state and local levels. Local staff who create new approaches to integrating or reporting data need a place to turn their

Informatics can be seen as a "bridge" between the program staff who collect and rely on data on individuals and families, managers who make operational and policy decisions based on program results and population data, and information technology staff who support the information systems that store and report the data used by others.

The public health informaticist helps each of those groups attach added meaning and value to data so that it better supports public health practice and decision making.

innovations over to in order to have them tested in others agency settings, and subsequently disseminated and supported in any agency that wants to adopt and adapt it.

Recommendations:

- Establish local and regional networks for peer-learning and for sharing informatics projects, such as the Metro Planners in the metro area
- Provide opportunities for local and regional staff to participate in MN-PHIN informatics projects.
- Provide MDH support to facilitate regional and statewide sharing of informatics solutions developed by one agency (sample reports, applications to integrate data from several databases, methods for cleaning data) that could be used by others. (Center for Health Informatics, MDH program divisions/consultants)

Attachment A – Local Agency Interviews

The Directors and staff of eleven local public health agencies were interviewed in daylong sessions in order to more fully understand:

- What information systems were currently used and how, especially the ability to run meaningful reports and exchange data with other systems or community partners.
- To what extent those systems were inefficient to operate or were not a meaningful tool for supporting and improving local public health practice; that is, they meet state or federal needs but not local needs.
- The types and attributes of staff who seemed to most understand what informatics is about.
- The hopes, dreams and vision of staff for what these systems could do in the future to support public health practice.

The agencies that participated in the interviews were:

- Blue Earth
- Carlton
- Cass
- Countryside
- Dakota
- Kandiyohi
- Roseau
- Sherburne
- St. Louis
- Ramsey
- Washington

Lila Taft of Dakota County Public Health and Sandy Macziewski of Countryside Public Health conducted the interviews.

Kristin Loncorich from the MDH Office of Health Policy, Vital Statistics and Informatics provided primary staff support for this project.

Appendix B – Detailed Findings from the Interviews

Introduction and methods

The following pages contain the detailed findings and recommendations from the eleven interviews with local public health agencies. Written notes from each meeting were taken by a recorder and subsequently validated with the notes from the interviewers. The needs, barrier, and gaps content were identified and grouped into one of five synthesized theme categories. The dreams and opportunities were also identified and grouped into a sixth category. Specific list of immediate and "straight forward" action opportunities were also identified. These tips and suggestions are beneficial, easy and obvious and need action right away. The results of this synthesis and grouping are shown below.

Observations and findings

Agency Management and Accountability

Accountability for how funds were spent; ability to be responsive to the consumer as well as changing community health priorities; accountability to public health's mission (population health, prevention focus); ability to report on outcomes.

Needs/barriers/gaps:

- Frequent changes in reporting requirements, without an explanation of why it's important. Given that agencies need to restructure their own data systems to capture new fields, adequate lead time is necessary before reporting can happen.
- Local, state, federal differences in measures for similar activity
- Reporting requirements that are not useful for local program management
- Legislative attitude that something is essential only if tied to a mandate; important programs are cut because they are not "mandated" or dropped as funding streams change
- Need for more importance to be placed on prevention
- Inability to address identified health priorities because of lack of funds
- Insufficient access to data with local health assessment, planning and evaluation impact
    - Data that is not in electronic format, data stored in systems that don't allow you to get it out, data fed to larger systems but provide no feedback or feedback that is not useful, data that is not timely, data held in systems outside the realm of public health.
- Undeveloped surveillance data sources
    - Jail health – identification of health needs (analyze impact of delayed health care because of loss of insurance coverage upon incarceration, mental health, chemical dependency issues); schools (better evaluation of early child find systems, trends in health conditions such as asthma, behavioral disorders, etc., potential linking of individual over time such as prenatal risk to birth outcome to child growth and development); public health intake systems (monitoring of types of requests coming into public health)
- Outcome measurement is difficult
    - Small populations, no idea of what to track, no data collected, results not immediately seen, results not seen in reporting period
- Policy changes – navigating layers in a system (working with satellite clinics, need for multiple levels to buy in to a project)
- Emergency preparedness – some conflict with roles of community partners

Program Management

Ability to deliver effective services and to use information systems to support service delivery.

Needs/barriers/gaps:

- Using data to drive policy and/or programming
  - Feedback to clinics needs to be clinic-specific, not county-specific, regional or statewide. For instance, communicable disease data summaries are not useful to providers unless it can be reported back at a clinic level.
  - Tobacco ordinances
- Lack of comparison data to put local findings in perspective.
  - For example, are increasing immunization coverage rates a result of our reminder-recall activity or are they going up across the state?
- Collecting and reporting/analyzing data in the same way to enable comparisons across the state.
- Need for MDH to evaluate and share statewide progress on health priorities, aid in identification of pockets of need, aid in identifying areas of best practice, promote awareness of complementary State and local activities focused on the same health priority.
- Lack of inter-operability across public health information systems means a public health nurse (PHN) doesn't have the data needed all in one place.
  - For example, a nurse may be visiting a family about child growth and development issues but not even know that the well water in that neighborhood has high coliform bacteria counts.
- Intake tracking – ability to follow up that requests received are assigned and completed.
- Need for web-based infectious disease system (current delays in notification, need for access at local and State PH and clinic)
- When information system changes are made, all partners need to participate in the planning

Efficiency

Streamlining workflow processes. Following core informatics principles such as, "enter data once, then use many times."

Needs/barriers/gaps:

- Same demographic data for the same person/family stored in many separate systems
  - A staff person has to look in multiple systems to get a complete picture of services and health indicators.
  - A change of address noted in one system doesn't get carried into associated systems, so an agency likely has to get multiple return mails before each system is updated.
- Lack of staff time to individually access multiple systems
  - Need to be able to see which systems a client has records with and access that information from one point as needed
  - Need to coordinate patient services (address multiple program services at the same time and eliminate extra client visits)
- Develop inter-operability across systems. Need to interconnect WIC, MIIC, Catch3, Follow Along Program, family/health MCH data systems. In this way, a new referral can be readily identified as an existing agency client or not.
- Import data from C&TC outreach activity into Catch3 (specifically from WIC)
- Ability to uniquely identify a person to support linking of data sets
- Unnecessary duplicate data entry; time required to update multiple systems
  - Need for a single entry place for demographics/addresses, auto fill-in on forms
- We need a greater ability to build a list in MIIC from a batch file. This could be used by schools, WIC, C&TC, and other programs that need client-specific immunization information.
- Systems that record the dailies could feed the payroll system.

- Ability to directly collect data at the time of activity (eliminate need to record on paper and later enter into computer)
- Ability to transfer information captured in one system but required in another (i.e. C&TC outreach contacts captured in CHIPS and needing transfer to Catch3)
- Minnesota Responds, Medical Reserve Corp – overlapping systems, don't meet need for local response system
- Applications developed for short-term fix for immediate needs, resulting in more fragmentation, more silos
- Difficulty navigating MDH resources (specifically MDH Workspace – needs a search engine).
- Mobility of people (need Web-based applications to access information as people move to new jurisdictions – Refugee health, WIC, etc.; ability of Follow Along to transfer electronically)
- Convert the Refugee Health and HepB applications to web-based.
- Ability to access FAP data as clients move
- Ability to store electronic signatures (not paperless yet). For instance, we still have to store paper consent forms, even if all other data is stored electronically.
- Need to send reportable data electronically (Long Term Care Consultations (LTCC), 485's, multitude of MDH required forms)
- Need to exchange information between programs (ht/wt/hgb between C&TC, WIC, nursing)
- Ability to access language materials electronically (eliminate need to carry multiple paper copies).
- Need for timely alerts on suspect infectious disease cases so that staff can follow-up appropriately and efficiently.
- Geo-coding upfront
- Resource management (inventories)

Informatics Capacity for Local and State Staff

Ability of individuals and organizations to use information systems and technology to understand and act on data for the purpose of improving public health practice and building healthier communities. This includes individual staff competencies, use of data standards, organizational policies and procedures, and use of information in practice.

Needs/barriers/gaps:

- Staff turnover – training/re-training issues, limited availability of training at time it's needed
- Systems need to be interoperable with other county infrastructure systems (i.e. payroll, financial accounting, billing systems) Limited help from the county
- No standard client index systems
- Need agreement on standard coding for billing
- Need to move more documentation systems to electronic
- Need tool to identify staff aptitude for health informatics development
- Facilitate local-to-local sharing of applications, templates, policies, best practices, training, etc. (Mantoux tracking, intake, immunizations, birth certificate, Crystal Report templates, etc.)
- Need for more staff with health informatics skills (limited access to staff who can pull and analyze data, more work than what can be handled by current staff)
- Public health work force (all employee classifications) need to demonstrate technical competence (ability to pick appropriate tool for the job, new graduates are given the technical skills needed)
- Not using technology that's here (lack of knowledge of what's possible, how to use, lack of time to figure out new technology).
    - For example, not all directors have remote access to an agency's network in order to respond to HAN messages from home.
- Many staff use an application without realizing what that application is capable of doing (printing labels, sorting, filtering, formatting, etc.)

- Building staff capacity in understanding how data can be used in driving policy/programming
- Difficulty in describing interventions and best practices, impact of interventions
    - Not stored in electronic systems, client documentation systems used for some programs but not others, no standard "language" across all agencies for describing public health activity (such as Omaha), services to community entities/groups not widely captured.
- Need for staff training in how to access and accurately pull data (knowledge of data structure, and understanding what is collected)
    - Difficulty in some systems in extracting data for analysis
- Need to build staff capacity to analyze and present data
- Need to geo-code everything to support mapping

Communication/Electronic Information Exchange

Use of data and other standards, developing common procedures, and practices are essential to support electronic information exchange. Exchange includes such agencies as other local health departments, MDH, other state agencies and community health care partners.

- Adopting vocabulary, such as Omaha, and other standards, and using this across public health interventions (individual and community).
- Keep HAN messages for the truly urgent (overuse leads toward "cry wolf" syndrome).
- Communication between community partners based on strategy/intervention (need to define who needs to communicate and what needs to be communicated)
    - Jail – sharing of physician med order, pharmacy, jail nurse
    - Referral information from human services
    - Tobacco compliance – need to share information between law enforcement, courts, public health, licensing
    - LTCC clients – share information between human services, public health, hospital, emergency room, physician, health plan
    - Others…Department of Corrections, schools, Department of Education, Indian Health Services.
- Contact management (people/agencies) – day-to-day and for essential personnel.
- Add telephone/cell phone numbers to birth certificate (need in order to make community contacts)

Dreams/Opportunities

This includes what directors and staff see are important and also an opportunity to achieve success with modest investment.

- Priorities for rapid progress on inter-operability and other enhancements to more effectively support local activities:
    - Make the key child health information systems (WIC, MIIC, CATCH III) inter-operable in order to more readily share demographic and service data.
    - HAN
    - Infectious disease reporting and feedback
    - Long term care
    - Jail health
- Single point of entry and maintenance for patient demographics and contact information.
- Ability to coordinate services across programs (who is active with what services, what components have been provided by another section so activities are not duplicated)
- Ability to capture community activities in health promotion
- Ability to electronically send and receive referral information, orders, correspondence, required report forms (and the follow-up tracking associated)

    - Create fillable forms that automatically add the data to a database(s).
- Disease Surveillance – local access (immediate)
- Public health data held centrally with local/transparent access; multiple point input and retrieval based on need (get own data, in own format, for own analysis)
- Health informatics training – technical how-to's, how to use data to drive policy/programming
- Ability to compare health needs, interventions, outcomes, identify best practices

Appendix C – Summary of Statewide Informatics Survey, Spring/Summer 2005

State of Public Health Information Technology in Minnesota

Introduction

Minnesota's public health system relies on effective coordination and collaboration between state and local public health agencies and their community partners. The need for rapid access to critical information – data from labs, disease and surveillance reports, birth certificates, environmental reports, and preparedness activities– has never been greater. With electronic exchange of data, the ability to get the right information to the right person at the right time provides considerable benefits but also presents considerable policy and technical challenges. As public health officials seek to control epidemics and address community worries, they rely on technology to gather information, send it where it is needed, and store it securely – in a matter of hours, not days. In an increasingly automated world, rapid detection of problems, rapid communication, and rapid response to any event with public health consequences is now an essential activity.

Methods

In the spring and summer of 2004 a survey was distributed to local health departments. The survey was part of a SCHSAC workgroup responsible for establishing a strategic action plan for the Minnesota Public Health Information Network (MN-PHIN). The survey asked each agency to list the primary data sets in use and corresponding (if any) software applications supporting that data set. The survey had 10 questions overall. Background information from MDH was based on the 2004 MDH data inventory.

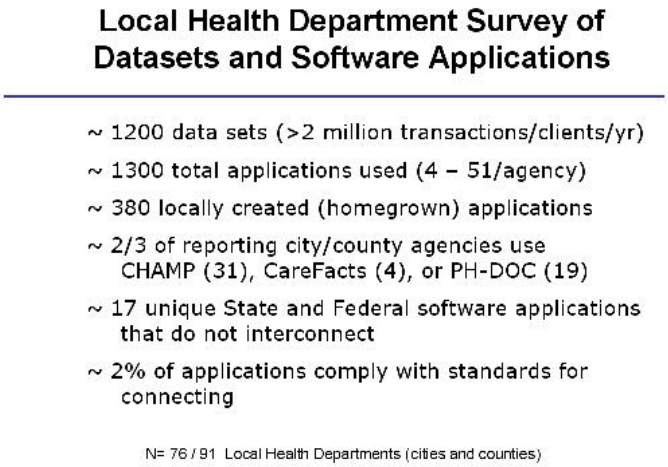
Findings

Seventy-six of 91 (84%) of local agencies responded to the survey. Respondents reported managing over 1,200 data sets. Most agencies did not have records for transactions but collectively they estimated more that 2 million transactions per year using their information system applications. The agencies reported a total of more than 1,300 electronic computer applications they access and/or manage. Several data sets require multiple independent applications be written to support program needs. For example, an agency may have access to the Minnesota Immunization Information Connection (MIIC) application but also need to use the CASA application for analysis of immunization coverage in a clinic or community, and may also need to write a custom data base application for special reports. Local agencies reported having a range from 4 to 51 different, unconnected software applications. More that 380 custom-built (sometimes referred to as homegrown) computer applications were reported.

The health information flow among public health agencies in Minnesota is complex. Fifty- two Community Health Boards (comprising 87 counties and four city public health departments) interact with program staff in seven divisions at MDH. MDH currently relies on a complex array of over 65 information systems to support information management at the state level.

Three applications that take an integrated approach to managing client data were reported: Thirty one agencies reported use CHAMP software, nineteen reported using PH-DOC and four reported using CareFacts. See Attachment D for descriptions of these and other applications used by local agencies. The agencies reported using 17 unique (and not interoperable) software applications provide by state government or the federal government.

Figure 1.



Discussion

Relatively few information Systems used by local agencies meet the interoperability and uniform functional requirements of today's public health professionals or their partners. Most notably, only an estimated 2 percent of state and local applications and systems comply with national standards for linking systems electronically.

This deficit has multiple consequences. Silo applications used by MDH and LPH departments require duplicate entry and complex manual transfer of information, and individual custom programs to transfer the data electronically are often needed. This results in inaccurate and untimely data for public health decision-making, as well as inefficient use of already very busy staff. Additionally, it limits information sharing between MDH and LPH departments and with community partners, healthcare organizations, or other authorized partners. Similarly, lack of statewide standards for strong security, login processes, and encryption require multiple security processes that are expensive to operate and administer.

Note: The report of preliminary findings for this statewide survey can be found on-line at http://www.health.state.mn.us/divs/chs/schsac/MNPHINfinal.doc

Attachment D—Key State, Federal and Commercial Software Applications Used by Local Health Departments.

These information system applications were identified by the local health departments in the 2005 survey.

A. State Provided Applications

1. *MIIC - Minnesota Immunization Information Connection*
   The Minnesota Immunization Information Connection (MIIC) is network of regional immunization services—health care providers, public health agencies, health plans, and schools working together to prevent disease and improve immunization levels. These services combine high quality immunization delivery with public health assessment and outreach to help ensure children and adults are protected against vaccine-preventable diseases.
   http://www.health.state.mn.us/divs/idepc/immunize/registry/index.html

2. *Rapid Inspection*
   Rapid Inspection 2004 creates inspection reports for food & beverage, lodging, mobile home & recreational camping, swimming pools, and youth camps. Water quality and well survey reporting are also included. http://www.health.state.mn.us/divs/eh/local/foodinspect/index.html

3. *Child & Teen Checkups (C&TC) [CATCHIII]*
   Child & Teen Checkups (C&TC) is the name for Minnesota's Early and Periodic Screening, Diagnosis and Treatment (EPSDT) Program. C&TC is a comprehensive child health program provided to children and teens from newborn through the age of 20 who are enrolled in Medical Assistance or MinnesotaCare. CATCH III provides the means to track which children need outreach to receive their periodic C&TC visits to their physician. www.dhs.state.mn.us/

4. *HAN Health Alert Network*
   Web based software for managing electronic e-mail and related communications for rapid alerts and public health emergencies. http://www.health.state.mn.us/han/lopubhlth/2004AboutHan.doc

5. *MAXIS*
   MAXIS is a computer system used by state and county workers to determine eligibility for public assistance and health care. For cash assistance and food support programs, MAXIS also determines the appropriate benefit level and issues benefits. The Department of Human Services operates this system

6. *SSIS*
   Social Services Information System (SSIS) is a child welfare case management tool for social workers designed to automate manual tasks, provide help to determine clients' needs, and generate information quickly so that families and children get the help they need. The Department of Human Services operates this system.

7. *MMIS*
   MMIS is an application that supports automated payment of medical claims and capitation payments for MinnesotaCare, MA, Prescription Drug Program, GAMC and Medicare Supplement Programs. The Department of Human Services operates this system

8. *MN-ITS*
   Web-based system to verify MA eligibility and submit MA claims

9. *CCM* = Client Case Management System. The Department of Human Services operates this system

10. *PRISM*
    PRISM is Minnesota's federally mandated automated computer system that supports Minnesota's child support enforcement program in efforts to establish paternity, establish orders and collect court ordered support for the benefit of children and families.

11. *FISS* = Medicare Fiscal Intermediary Shared System is the standard Medicare claims processing system used to inquire about beneficiary eligibility and other issues related to participation in Medicare.

12. *CHIPS/WIC* -- An application for managing WIC services, including scheduling, printing vouchers, and tracking education and referrals.
    http://www.health.state.mn.us/divs/fh/wic/localagency/infosystem/index.html

B. Federal Government Provided Applications

1. *WinCASA*
   CASA (Clinic Assessment Software Application) is a public domain software application developed by the CDC (Centers for Disease Control and Prevention) used to assess immunization levels in public or private clinics. www.cdc.gov/nip/casa

C. Commercial and Consortium Provided Applications

1. *CHAMP*
   CHAMP Software has been providing software solutions for home health, community and public health care agencies since 1985. Originally developed by a CHS Administrator for his own agency, the application has grown to be one of the largest home care and community health software vendors in the Midwest, with over 100 agencies in the Midwest, West Coast, and Gulf Coast. CHAMP uses the Omaha taxonomy to standardize documentation of care. http://www.champsoftware.com/about/index.html

2. *CareFacts*
   CareFacts' HIS software platform offers over 200 healthcare agencies a networked PC-based, clinically driven application suite designed to address all aspects of patient interaction including scheduling, patient charting, reporting and billing.

3. *PH-DOC*
   Public Health Documentation (PH-Doc) is an integrated public health software application developed by a consortium of local agencies in Minnesota. The application supports nursing and other program documentation, as well as information needed for business operations (dailies, accounting, annual reporting to MDH). PH-Doc is used exclusively in Minnesota, and was developed by a Community Health User Group of the Minnesota County Computer Cooperative (MCCC). MCCC is a joint powers organization providing services, software, and other cost-effective measures to substantially reduce the cost of data processing for counties.

4. *CCC* = Communities Caring for Children
   An integrated MCH outreach program developed jointly by agencies in Northwest Minnesota.

5. *EVS* = Eligibility Verification System

6. *E-Chronicle* = A web-based tool designed by MDH and local staff for reporting activities related to tobacco cessation and prevention, youth –at-risk and other health promotion programs.
   http://www.health.state.mn.us/divs/hpcd/tpc/pdf/E-Chronicle%20Manual_version%202.pdf

7. *EH-DOC* = The environmental health component to PH-DOC described above, used for capturing inspection and other data related to local environmental health activities.

Attachment D

MN-PHIN Informatics Profiles

Measuring and Building Public Health Informatics Capacity in Minnesota

The Profiles measure …

Functional Capacity

An informatics-savvy organization …

- Creates strategic direction for informatics within the agency
- Assures knowledge, data and information needs are met
- Assures effective management of information systems
- Assures effective management of IT operations.
- Communicates with policy makers, staff and the public
- Leverages data standards
- Evaluates and improves information systems/applications
- Assures interoperability with other information systems.
- Assures confidentiality, security and integrity of data
- Provides training in public health informatics

Necessary to Achieve

Resource Capacity

An informatics-savvy organization has …

Staff Competencies

- Senior Informaticians
- Directors & Managers
- Front line staff

Applications/Systems

- Standards/ Interoperability
- Data Management/ Reporting Tools
- Inventory of Systems and Datasets

The Community of Practice supports…

Community of Practice

Created to Build Functional and Resource Capacities

Minnesota Public Health Information Network
MDH Center for Health Informatics

Assessment

- Self Assessment Tools
- Statewide Assessment

Informatics Tools

- Planning Methodologies
- Project Tools

Informatics Education

- Peer-to-peer Knowledge Sharing
- Print Materials
- Webinars
- Regional Workshops

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Attachment E

Public Health Data Standards

Improving How Public Health Collects, Exchanges and Uses Data

Introduction

The health care and public health communities are transforming how they manage and use health information. Rapid advances in information technology, coupled with national calls to improve the efficiency, quality and safety of health care, have contributed to a bold and historic initiative to create a national health information infrastructure.

Public health agencies are necessarily a part of this monumental transformation. Much of public health data comes from hospitals, laboratories and private providers. And public health has considerable data that has health policy, research and clinical value.

A key component necessary for the success of this nationwide transformation is the widespread adoption of data standards.

What Are Data Standards?

Data standards are an agreed-upon, common and consistent way to record information. They allow data to be exchanged among different information systems, and for that data to have consistent meaning from system to system, program to program, and agency to agency.

Data standards are important in almost every aspect of our lives. They are what make it possible for us to consistently measure distances and time, get the same results from a recipe as our next door neighbor, place phone calls across the globe, and withdraw money from almost

any ATM in the world. Without standards, the electronic exchange of information that occurs every second of every day across countless businesses and organizations would grind to a near halt. Without a consistent way to denote a piece of data, the communication, interpretation and translation of that data would become time-consuming at best, and totally erroneous at worst.

With public health data, standards make it possible for us to, for example, collect client names in the same way (for example, one field for first name, a second for middle initial, another for last name, and a final field for suffixes). When information systems collect and store client names in the same way, it is much more efficient and accurate for one system to send that data to another, or to compare and match names from two different systems so the data can be exchanged or merged.

Another example is how we agree to denote vaccine products. Td, DT, DTaP and TdaP are all different vaccine formulations. Without agreement on how to standardize the abbreviations, a public health nurse couldn't be sure what vaccine product to give today or whether a dose has to be repeated or not

There are different types of standards, each serving a particular purpose. For instance, there are standard ways to code nursing functions (the Omaha system used in PH-DOC, CHAMPS, and CareFacts), for diagnostic codes (ICD-9), to bill for medical services
(CMS 1500), to send health data between different information systems (HL7), and to code lab results (LOINC). In every case, standards enable computers to send data back and forth, usually in the same format and meaning the same thing. Being able to exchange data from information system to information system, without having to translate it into a new format and being able

to retain the same meaning, is what is meant by the term *interoperability*.
So standards are basically universally agreed upon ways to handle data in ways that ensure interoperability.

What standards are most important to public health?

There are 2,100 different standards being used in health care today—an unwieldy number that highlights how standards have historically arisen to meet very specific needs in specific types of settings. Reducing these to a manageable number that health care organizations, public health agencies, and venders can reasonably work with is the focus of considerable work nationally. For our purposes, we can group relevant standards for public health into four categories;:

- Terminology
- Messaging
- Transactions/claims
- Data content

Terminology standards are ways to define and classify individual health and other terms so that they are easily and consistently understood from one organization to another. Table 1 highlights the most important content standards for public health.

Table 1. Examples of Terminology Standards[5]

Type of Content Standard	Definition	Example	Link
Code Sets	A list of codes, each code being associated with a particular result, product or term.	LOINC (Logical Observations, Identifiers, Names, and Codes): Widely used by public health and clinical laboratories for electronic reporting of lab results. CVX: Code set developed by CDC to uniquely identify each vaccine product.	LOINC CVX
Classification systems	A method for classifying data into terms that can be easily and consistently reported, understood, retrieved and analyzed	ICD-9-CM: The International Statistical Classification of Diseases and Health Related Problems – Clinical Modification is widely used by hospitals for both billing and statistical analyses, such as studies using hospital discharge data. ICD-9 is the classification used to code and classify mortality data from death certificates.	ICD-9-CM ICD-9
Nomenclature	Specialized terms that are given standardized, precise and unambiguous definitions, which makes meaningful exchange of data between providers possible.	SNOMED: The Systemized Nomenclature of Medicine is a robust classification system used in human and veterinary medicine. Omaha System: A system for standardizing terminology used in nursing. Used in PH-Doc, CHAMPS and other integrated public health information systems.	SNOMED Omaha

[5] Adapted from the Public Health Data Standards Consortium's tutorial module on data standards, 2006.

Creating consistent ways to classify data is critical but you also have to have a consistent way to send data back and forth between organizations. That is the role of **messaging standards**. The most widely used messaging standard in public health and health care is HL7 (Health Level 7)[6].

Health Level 7 is a way to package data so that the receiving computer knows precisely what data is coming in, and where each data element occurs in the electronic file. For instance, HL7 will tell the receiving computer, "The next data you read will be Patient Identification Information." It does this by using a specific HL7 code (in this case, 'PID') and putting it immediately in front of the string of relevant data, like so:

PID||0493575^^^2^ID1||DOE^JOHN^M^^|DOE^JOHN^M^^|19480203|M||B|254E38ST^^ DULUTH^MN^55802^USA||(218)625-4359|||

While this may look confusing at first, one of the advantages of an HL7 message is that it is, without too much effort, fairly readable by humans.

The HL7 coding scheme is used for a very wide range of clinical and

demographic data, any of which may need to be exchanged between health care organizations. The beauty of HL7 is that the two organizations do not need to be using the same information systems—HL7 makes it possible for the computer in the receiving organization to make sense of the incoming data without staff having to manually sort the data into the appropriate fields.

Transaction or claims standards provide a uniform method for sending bills and getting reimbursed, as well as for exchanging other types of administrative data. Prior to these standards, processing claims was a very expensive task for both providers and insurance companies. Every insurance company had their own forms and requirements that providers had to learn. For years, the standard paper claims form was the Uniform Bill-92 or UB92. With the enactment of the Health Insurance Portability and Accountability Act (HIPAA), the paper UB-92 form was replaced by the electronic standard ASC X12N 837. Any provider that bills electronically must produce the claim using this format.
By adopting this standard, the HIPAA requirements seek to improve administrative efficiency by reducing administrative costs across all health and health care settings.

Data content standards is a broad term that covers a wide range of data standards, mostly around establishing a consistent, uniform way to capture, record and exchange data. For instance, when immunization registries first emerged in the early-1990's, CDC created a standard known as the Core Data Set that every registry could use not only as the basis for building or buying their application, but also for establishing what data needed to be reported by providers.

A well-known example of a data content standard is how we collect race and ethnicity data. If we did not have a standard way to collect this information (established by the National Committee on Vital and Health Statistics), we could not readily merge, compare, exchange or analyze different reports/data sets that included race and ethnicity data. (When the Census Bureau changed their taxonomy for collecting race and ethnicity data, it created monumental problems for comparability of data, both across time and across different information systems, since the old and new data content standard did not match, the new being much

[6] For the curious, Health Level 7 refers to the top layer (Level 7) of the Open Systems Interconnection (OSI) layer protocol for the health environment.

more complicated and nuanced (although arguably more accurate.))

The definition of terms used in the CHS Performance and Practice Measurement System (PPMRS) and for the Environmental Health Knowledge Management project are two more recent examples. As a state, we cannot have comparable—and so meaningful—statewide data if every agency defines "visit" or "inspection" differently.

Though not listed above, HIPAA has established a national floor for **privacy and security standards** which are of vital importance to health care and public health but which are beyond the scope of this paper. More information can be found at http://www.hhs.gov/ocr/hipaa/.

Why do we need data standards in public health?

The critical need for data standards rises from factors both internal and external to public health. Chief among them are:

- The demand for a more efficient and responsive public health system that uses its data as a resource to improve community health and public health practice.
- The increasing need to exchange data across public health information systems in order to create more complete and integrated profiles of clients, families, and communities. [7]
- The increasing need to exchange data with hospitals and private providers, as well as with jails, state agencies, other local health departments, long term care facilities, and others.
- The frustration of working with silo information systems that cannot readily exchange data, often don't support quality care/services or improvements in public health practice, are inefficient, and make comprehensive community assessments difficult.
- The fact that the health care industry is moving rapidly, through both mandates and market forces, toward an increased adoption of standards. Since they are the source of much of public health's data, we need to ensure out information systems can readily accept and exchange that data.

What do data standards mean to me as a public health professional?

As we increasingly move toward broader use of data standards, public health agencies will benefit in a number of ways:

- Greater continuity of care because you will be able to exchange clinical data with private providers on clients you are both serving. This also means that public health can participate in the regional health information exchanges that are beginning to emerge around the state.
- The ability to receive data from others without having to manually translate the data into a form and format that works for your information systems.
- More meaningful reports, because there will be more consistency in how data gets entered, merged and shared.
- More complete profiles of clients, families and communities because data from different information systems can be consolidated and integrated view.
- Less need for double data entry, because data can be exchanged between information systems that include records on the same client. Because the information systems can 'interoperate,' the data from one system can be used to populate the other, saving data entry time (and reducing the chances of data entry errors).

[7] It should be noted here that integrating data from several sources does not imply integrating those data into a single database. But an integrated *view* of data is possible when data standards are used to merge data from different sources into a single report or profile.

How do I know if the applications I rely on use data standards?

It is an unfortunate reality that public health information systems do not historically rely on data standards to any great extent. Partly this is because many standards arose out of the need to process claims, and many public health services and their associated data are not reimbursable in the traditional sense. The result is that we do not have codes for data such as client risk factors and symptoms, community coalition building activities, and many health promotion and prevention services.

How can I begin?

There are places you can start within your program or agency to move toward standardizing your information systems.

- Verify that the demographic fields in your applications match standards set by the National Committee on Vital and Health Statistics. You may decide to begin changing any systems that do not meet this standard; for instance, by moving from a single name field to having separate fields for first, middle and last names. This is not a trivial task, and involves either writing a script (a short program written in computer language to perform a defined task) to move the last word in the single name field into Last Name, and any single letters into Middle Initial, or manually moving/reentering the data. Using an automated script requires careful review to ensure accuracy. You will want to ensure any new applications you develop or purchase match these demographic standards.
- Make sure your staff are entering data in a standardized way. It's not uncommon for different staff to use the same fields in different ways or to enter the same data in different ways. Exporting select data fields into a spreadsheet enables you to easily scan down each column to identify unacceptable variations in data entry, either by how data is entered or by inconsistent uses of a field. (Sometimes this is done intentionally because an application doesn't have a field for data the agency wants to collect, so they use an otherwise unused field. These are good ones to check for consistent use across all users.)
- Whether developing or purchasing an information system, seek to minimize the number of free text fields. Because there are few controls and ways to standardize what data gets entered how, the data is unlikely to ever be useful for exchange or reports. For instance, if you allow the hematocrit test to eb entered as free text, you may get 'Hematocrit,' 'Crit,' or 'PCV'—data that is not easily used in creating a report on, say, the number of hematocrits run in the last month. Use picklists wherever possible to standardize data entry and minimize data entry errors.
- Ensure that any content standards used in your purchased applications are maintained and routinely updated by the vender. Standards are generally driven by the user community, so changes are not uncommon. Verify that your vender is using, or shortly plans to release, the latest version of a standard such as the Omaha System.
- Ensure your lab and clinical data match the appropriate content standards. For instance, your immunization screen should include the core data set established by CDC and adopted by the Minnesota Immunization Information Connection. Lab results should match LOINC codes.

Who needs to care most about standards?

While in truth, adherence to data standards are the business of every public health staff person that uses information systems, some staff clearly have more responsibility around standards than others. These are:

- Anyone who enters data, to make sure the same data from different people is

entered in a consistent way, so that any reports using that data—and exchanges of that data with others—are consistently meaningful.

- Anyone developing an application or information system of any size. Since you can never be sure what sort of life even a small and seemingly short-lived application is going to have, make sure to develop it using whatever standards are most appropriate.
- IT managers responsible for the operations, interoperability and security of agency information systems.

Where can I find out more?

1. The Public Health Data Standards Consortium (http://phdatastandards.info/)
2. The Center for Disease Control and Prevention's site on the Public Health Information Network (www.cdc.gov/phin)
3. Healthcare Information Technology Standards Panel: A national initiative to harmonize health care standards (http://www.ansi.org/standards_activities/standards_boards_panels/hisb/hitsp.aspx?menuid=3)
4. MDH Center for Health Informatics (www.health.state.mn.us/e-health)

Attachment F

Consumer Benefits

Population health perspective

- I will have access to more complete, integrated and timely information about health risks and resources in my community, so I can make better decisions about managing my health
- I have greater confidence that, because public health agencies and healthcare providers are connected electronically, they can communicate more easily and respond quicker in the event of a health emergency.
- I am assured that public health agencies will work effectively with others to control outbreaks of disease and environmental hazards.

Personal health perspective

- Visits to my home can be better coordinated among the nurses and aids that come to see me.
- I save time and worry because there is no need to fill out lengthy forms or explain my health history (and possibly forget something important) when I sign up for services from my public health agency.
- I increase the likelihood of receiving appropriate and safe care because the public health nurse has all the information she needs to make the right decisions.
- My health information can be sent between my doctor(s) and the public health agency, so that each has the most current information and tests won't be repeated.
- I can use secure e-mail to ask my public health nurse confidential health questions.

Staff/Agency Benefits

Population health perspective

- We can electronically and promptly receive reportable disease information from MDH.
- We can much more readily combine data from different sources to get an integrated view of a community's health indicators and risks.
- We can respond to public health emergencies more rapidly and effectively because of the electronic exchange of information.
- We can post prevention and health information on our web site, which is not only cheaper than printing brochures but is easier to update with new information and respond to new needs.

Personal health services perspective

- It is easier to coordinate care across multiple providers because sharing information is easier and more timely.
- I will save time and frustration by no longer having to enter and update the same client/family information in multiple systems.
- I can assess a client's health status and service needs by looking in one electronic record that integrates data from other providers, as well as environmental health and other public health programs.
- We can save time by electronically sending information on our clients to health care organizations, rather than copying, faxing or mailing paper records.
- We can easily send reminder notices so needed services are provided at the right time and we have fewer no-shows at clinics.