System Priority: Integrated Electronic Data and Information Systems
Objective: Wisconsin Public Health Information Network (PHIN) (Logic Model)

Long-term (2010) Subcommittee Outcome Objective: By 2010, Wisconsin will have an integrated electronic information system that measures public health system capacity and provides meaningful information about Wisconsin's 5 infrastructure priorities and 11 health priorities for individuals and organizations to improve the health of Wisconsin's population.

Long-term outcome objective updated as of: Sept 2004

Inputs	Outputs		Outcomes		
	Activities	**Participation/ Reach**	**Short-term 2002-2004**	**Medium-term 2005-2007**	**Long-term 2008-2010**
The following list of inputs (i.e., what we invest – staff, volunteers, time money, technology, equipment, etc.) is appropriate for <u>all</u> outcomes and activities for this infrastructure priority. Each input listed may be called upon during various stages of implementation – or they may be involved in every step, depending on the need. • Wisconsin Public Health Data Steering Committee • PHIN program director, advocacy team, executive oversight committee, and program team • Division of Public Health staff	Accomplishment of this priority and these objectives is not a linear process, although some things need to be implemented earlier than others. While the Department of Health and Family Services has the statutory responsibility to create a public health data system, much of the data is created in systems outside the Department. It is critical that mechanisms be developed to integrate these various information systems. The "Inputs, Outputs, and "Participation/Reach" that follow transcend all objectives. Achieving the medium and long term objectives is directly linked to the groundwork laid by implementing the short term objectives. This plan describes what the *Healthiest Wisconsin 2010* Integrated Data Sub-Committee believes to be the necessary components of oversight and standardization to create this system of systems. There are many different project methodologies that can be used to successfully create information systems. Appendix C provides an example of one methodology. **Organization and Management:** • Create organizational structures within public health system partner organizations that will allow for successful management of public health information network activities as shown in Appendix A. • Establish a statewide PHIN executive oversight	The following list of participants and reach members/ organizations (e.g., community residents, agencies, organizations, elected officials, and policy leaders) is appropriate for <u>all</u> outcomes and activities for this infrastructure priority. Each member/organization listed may be called upon during various stages of implementation. • System users • Community HMO • Health care providers • Division of Public Health • Local health departments and boards of health • American Indian Tribes	By March 1, 2004, Wisconsin will establish the PHIN organizational framework necessary for the successful implementation of an integrated electronic data and information system, a key infrastructure priority of *Healthiest Wisconsin 2010*. By 2004, Wisconsin will develop a framework that: (1) standardizes the collection and tracking of data (including demographic and socioeconomic data) for the 11 health and 5 infrastructure priorities; (2) uses and links to existing, established information systems; and (3) complies with state and federal regulations and security requirements.	By 2007, there will be an increase in the number of individuals and organizations using information from PHIN.	By 2010, Wisconsin will have deployed an integrated electronic information system, PHIN, which measures public health system capacity and provides meaningful information on Wisconsin's 5 infrastructure and 11 health priorities for individuals and organizations to improve the health of Wisconsin's population.

Inputs	Outputs		Outcomes		
	Activities	**Participation/ Reach**	**Short-term 2002-2004**	**Medium-term 2005-2007**	**Long-term 2008-2010**

• *Healthiest Wisconsin 2010* partners
• Local health departments
• Tribes and Great Lakes Intertribal Council
• System users
• Data Expert Advisory Workgroup
• Resources from private sector, public sector, non-governmental sources (e.g., Robert Wood Johnson Foundation, Blue Cross/Blue Shield Foundation)
• Resources from existing standardized systems
• Sub-project stakeholders, users, and teams
• Help desk staff
• Public health preparedness grants
	committee. This committee should consist of representatives of the *Healthiest Wisconsin 2010* partners and should represent all public health system partners, both traditional and nontraditional.
	• Establish program teams comprised of both technical and public health experts whose tasks include managing the sub-projects as approved by the executive oversight committee.
	PHIN activities include, but are not limited to: (1) staffing, recruiting, and/or appointing staff to the project teams; (2) commitment of resources by the *Healthiest Wisconsin 2010* partners to manage and sustain the project; (3) identifying and categorizing key stakeholders; (4) establishing a project portfolio that will be added to, as sub-projects are approved; and (5) establishing an architectural blueprint that will depict the integrated systems from both a public health and data perspective. The blueprint will be updated each time new components are added or updated, ensuring a current view of PHIN.
	• Coordinate activities with the implementation of the *Healthiest Wisconsin 2010* objectives as documented in the Robert Wood Johnson Foundation Wisconsin Turning Point Grant that include:
	  • Select and disseminate to the public health system partners a validated state-level minimum data set to measure and track progress for at least 75 percent of the outcome objectives for the 11 health priorities set forth in *Healthiest Wisconsin 2010* using scientific, interdisciplinary, and collaborative leadership approaches.
	  • Select and disseminate to the public health
		• Legislators
		• Individuals, communities, and organizations
		• Department of Health and Family Services
		• *Healthiest Wisconsin 2010* partners
		• Other state governmental agencies (e.g., Department of Natural Resources, Department of Agriculture, Trade and Consumer Projection, Department of Traportation, Department of Emergency Management
		• Media			

Inputs	Outputs		Outcomes		
	Activities	**Participation/ Reach**	**Short-term 2002-2004**	**Medium-term 2005-2007**	**Long-term 2008-2010**
• Public Health Preparedness Information Technology Advisory Committee • Robert Wood Johnson Foundation grant	system partners a validated companion local-level minimum data set to measure and track progress for at least 60 percent of the outcome objectives for the 11 health priorities set forth in *Healthiest Wisconsin 2010* using scientific, interdisciplinary, and collaborative leadership approaches. • Identify gaps, select local community measures, and determine how measurements will be developed where no local or statewide minimum data sets exist, and disseminate findings and recommendations to Wisconsin's local health departments and their community partners. (Note: This will include consultations with the Washington Department of Health regarding over-sampling procedures/processes used to determine local data). **Data Standardization:** • Establishing overarching standards is critical because PHIN is a "system of systems." (A basic set of standards and best practices to ensure interoperability, usability, security, data integration, maintainability, and supportability.) • The director and staff will propose standard definitions and measures to be used in all system activities and will be approved by the executive oversight committee. • The executive oversight committee will establish overarching standards and best practices for all system activities. • The program team will create, publish, and use standard definitions and measures to be used in				

Inputs	Outputs		Outcomes		
	Activities	**Participation/ Reach**	**Short-term 2002-2004**	**Medium-term 2005-2007**	**Long-term 2008-2010**

	all system activities.
	• Input sources for this step must include the consideration of existing standardized elements/systems such as:
	  • National Electronic Disease Surveillance System
	  • Health Alert Network
	  • Department of Health and Family Services common core data standards
	  • U.S. census data
	  • *Healthiest Wisconsin 2010* minimum data sets
	  • Medicare/Medicaid and insurance standards
	  • Health Insurance Portability and Accountability Act
	  • Vital statistics (e.g., birth and death certificate data)
	  • Other national models/standards
	
	Uses and Links to Existing Established Information Systems - Current State Assessment:
	Produce a current state assessment to establish a "snapshot" of available data systems in Wisconsin to identify gaps, overlaps, and opportunities for integration. (Planning and decision making relies heavily on understanding what *is*. This critical step is necessary to ensure success of an integrated electronic data and information system.) Parameters of this assessment are detailed in Appendix C.				

Inputs	Outputs		Outcomes		
	Activities	**Participation/ Reach**	**Short-term 2002-2004**	**Medium-term 2005-2007**	**Long-term 2008-2010**
	State and Federal Regulations and Security Requirements: Document the state and federal regulations that will be used to develop this network (e.g., confidentiality and security agreements, role-based security, the National Health Insurance Portability and Accountability Act regulations). Discussion of security and privacy are in Appendix D. Document and publish the security requirements for the system.				

System Priority: Integrated Electronic Data and Information Systems
Objective: Wisconsin Public Health Information Network (PHIN) (Template)

Long-term (2010) Subcommittee Outcome Objective:

By 2010, Wisconsin will have an integrated electronic information system that measures public health system capacity and provides meaningful information about Wisconsin's 5 infrastructure priorities and 11 health priorities for individuals and organizations to improve the health of Wisconsin's population.

Long-term outcome objective updated as of: Sept 2004

Wisconsin Baseline	Wisconsin Sources and Year
This is a developmental objective	
100+ unrelated databases lacking standardized data elements and information	Department of Health and Family Services Wisconsin Health Care Database Survey Report. August 16, 1999.

Federal/National Baseline	Federal/National Sources and Year
No data available.	

Related USDHHS Healthy People 2010 Objectives			
Chapter	**Goal**	**Objective Number**	**Objective Statement**
23	Ensure Federal, Tribal, State, and local health agencies have the infrastructure to provide essential public health services effectively.	23-1	(Developmental) Increase the proportion of Tribal, State, and local health agencies that provide Internet and e-mail access for at least 75 percent of their employees and teach employees to use the Internet and other electronic information systems to apply data and information to public health practice.
		23-2	(Developmental) Increase the proportion of Federal, Tribal, State, and local health agencies that make information available to the public in the past year on the Leading Health Indicators, Health Status Indicators, and Priority Data Needs.

Definitions	
Term	**Definition**
Wisconsin Public Health Data Steering Committee (WPHDSC)	Refers to the formally recognized committee comprised of state, local, and public health system partners who advise both the Wisconsin Division of Public Health and the Wisconsin Turning Point Initiative in the implementation of the state health plan – *Healthiest Wisconsin 2010* – as it pertains to public health information system development.
Health Alert Network (HAN)	The Health Alert Network (HAN) is a communications system for Wisconsin's public health preparedness. It is funded by the U.S. Centers for Disease Control and Prevention with the goal of an improved communications infrastructure for all Wisconsin health agencies and

	organizations and their partners. This is done by: • Fostering high-speed and dedicated Internet connections for our local public health agencies. • Creating a secure web site and emergency messaging system for communications among health agencies for bioterrorism and public health threats. • Establishing a distance learning capability to foster greater public health organizational capacity and public health preparedness development.
National Electronic Disease Surveillance System (NEDSS)	The National Electronic Disease Surveillance System (NEDSS) is an initiative that promotes the use of data and information system standards to advance the development of efficient, integrated, interoperable surveillance systems at the federal, state, and local levels. It is a major component of the Public Health Information Network (PHIN). This broad initiative is designed to: • Detect outbreaks rapidly and to monitor the health of the nation. • Facilitate the electronic transfer of appropriate information from clinical information systems in the health care system to public health departments. • Reduce the provider burden in the provision of information. • Enhance both the timeliness and quality of information provided.
Public Health Information Network (PHIN)	The Public Health Information Network (PHIN) is a crosscutting and unifying framework to monitor data streams for early detection of public heath issues and emergencies. (It is the "system of system of systems." Through defined data, vocabulary standards, and strong public health collaborative relationships, the PHIN will enable consistent exchange of response, health, and disease tracking between public health partners and capitalizes on the potential for cross-fertilization of data exchange. The PHIN moves the public health system away from isolated data systems. Ensuring the security of this information is critical, as is the ability of the network to work reliably in time of national, state, and local crises. The PHIN is composed of five components: 1. **Detection and Monitoring:** disease and treat surveillance and national health status indicators. 2. **Analysis:** real-time evaluation of live data feeds, turning data into information for people at all levels of the public health system. 3. **Information Resources and Knowledge Management:** providing intuitive access to reference materials, integrated distance learning content, and decision support. 4. **Altering and Communications:** enabling emergency

	alerting, routine professional discussions, and collaborative activities. 5. **Response:** management support of recommendations, prophylaxis, vaccination, etc.
Surveillance Systems	Surveillance systems collect and monitor data for disease trends and/or outbreaks so that public health personnel can protect the health of the nation, states, and local communities.

Rationale:

An integrated electronic public health information system is needed to effectively serve the data needs of the local, state, tribal, and national public health workforces and Wisconsin's citizens. On a daily basis, partners in the Wisconsin public health system - government public health professionals, health providers, tribal representatives, researchers, community advocates, faith-based community volunteers, insurers, business leaders, policymakers - feel limited in their ability to access relevant, population-based information. Though many data systems exist, these systems are not based on an established set of standards and operate independently, thus contributing to inefficiencies such as duplicative data entry, incomplete data on individuals, families or communities, and unreported information.

The proposed concept for an integrated public health information system is the Wisconsin Public Health Information Network (PHIN). PHIN is an electronic "system of systems," integrated by data and functionality that supports the monitoring of the public's health, detects health problems, analyzes data, communicates health alerts, and creates useful information. PHIN cuts across all essential public health services that are linked to the core functions of assessment, policy development, and assurance. The PHIN will transform public health by coordinating its functions and organizations with information systems that will enable: (1) real-time flow of data, (2) computer assisted analysis, (3) decision support, (4) professional collaboration, and (5) rapid dissemination of information to public health officials and providers, clinical health care providers, and the public.

Once implemented, the PHIN will provide meaningful information at the state and local level on which to base accurate decisions for action, intervention, evaluation of progress, and fiscal impact. The information generated will assist the Department of Health and Family Services in setting and directing public health policy, assuring access to care, evaluating progress toward *Healthiest Wisconsin 2010* health and infrastructure priorities, and measuring public health system capacity. It will provide the capacity to monitor health status, share information, educate the workforce, and inform residents with timely and accurate information to improve the health of Wisconsin's population.

Over the past several years, the Wisconsin Turning Point Initiative's Transformation Team collected data that identified an integrated electronic public health information system as crucial to transforming the public health system in Wisconsin. "Wisconsin must develop an integrated electronic, public health information system to provide statewide and community-level (county, municipality) population data needed for status assessment, policy development, assurance, service delivery, resources management, and accountability." Thirteen recommendations from the Turning Point Transformation Team included the ability to:

- Measure health status and health capacity based on Wisconsin's 5 infrastructure and 11 health priorities.
- Provide leadership to link systems with Wisconsin's priorities.
- Conduct statewide assessment on information requirements.

- Identify minimum data sets of standard, common core elements for collection and reporting.
- Ensure that state and local resources align with identified priorities for maximum input.
- Increase access to Internet, e-mail, and other technology.
- Increase geographic coding and use.
- Use information to determine outcomes and fiscal accountability.
- Ensure access to meaningful information, in a timely manner, to local communities.
- Work with public health system partners (private and public) to identify common formats.
- Develop/improve data systems for consistent and accurate reporting on race, ethnicity, and sex to increase understanding and eliminate disparities.
- Ensure confidentiality.
- Conduct research specific to vulnerable populations with significant health disparities.

The U.S. Department of Health and Human Services (USDHHS) and Centers for Disease Control and Prevention (CDC) document, *Public Health's Infrastructure,* raised concerns about the readiness of the national public health system to respond to public health threats of the 21st century. A robust information and data system was identified as the most important infrastructure component. The document provided a basis for beginning the building of an integrated data system that would include, "guidelines, recommendations, health alerts, standards-based information, communication systems that monitor disease and enables efficient communication" among affected organizations.

Based on the *Public Health Infrastructure* report findings, the U.S. public health infrastructure is "insufficient to protect Americans from emerging threats." The American Public Health Association said that rebuilding of the public health infrastructure is one of the national priorities. They supported establishing partnerships to address the infrastructure issues of information and data systems, workforce capacity and competency, and organizational capacity at the state and local health departments and laboratories.

In addition to preparedness and capacity, selected data activities including integration, standardization, and information dissemination are also key components of an integrated electronic data system. The CDC identified "accessing and using nontraditional and diverse sources of data for surveillance" from public health and other disciplines; "improving timeliness and quality of data while also reducing the burden of collecting data", and "ensuring privacy and confidentiality" of client data as key data strategies to keep in mind when developing an integrated electronic public health system.

The 1996 National Health Insurance Portability and Accountability Act prescribes the development of electronic health information technologies to improve efficiency and provide for security and privacy of individually identifiable health information. This act describes how individually identifiable health information may be shared and transmitted electronically and develops a basis for standardization of health-related data

The Wisconsin Public Health Data Steering Committee, a statewide committee of local and state public health representatives addressing data needs, forwarded several recommendations regarding PHIN that include:

- Hiring a Public Health Data Coordinator.
- Establishing an organizational framework to manage system and data needs (Appendix A).
- Integrating existing systems into a larger system, including financial support.
- Including the Health Alert Network as a key component of the infrastructure.

- Identifying public and private resources for information technology.
- Identifying opportunities for system development.
- Creating a marketing plan to inform public health leaders, policymakers, potential funding sources, and key partners about the importance of PHIN and the need for financial commitment.

In 1999 and 2000, Wisconsin received funding from the Centers for Disease Control and Prevention to participate in two initiatives that are key to developing Wisconsin's PHIN: (1) the Health Alert Network, and (2) the National Electronic Disease Surveillance System. The Health Alert Network supports the public health response infrastructure by creating a network, providing training, and monitoring organizational capacity. The National Electronic Disease Surveillance System ensures essential public health capabilities by using a common data model, creating a secure, web-based method for integrating all public health surveillance and information systems, creating an integrated data repository, and assuring that all systems are the National Electronic Disease Surveillance System-compliant.

In "The Public Health Information Network: A Work in Progress," a brochure created for the Public Health Information Network Conference May 13-15, 2003, PHIN building blocks include:

- Surveillance Monitoring and Tracking Systems, including:
  - National Electronic Telecommunications System for Surveillance
  - National Electronic Disease Surveillance System
  - National Healthcare Safety Network
  - Environmental Public Health Tracking Network
  - Data standards
- Communication and Learning Management, including:
  - Epidemic Information Exchange
  - Health Alert Network
  - Learning Management Systems
  - Laboratory Information Management Systems

Using these building blocks, Wisconsin's network will serve to integrate relevant health and disease information along with laboratory results and surveillance data from the many members of the health care community and the public health system. In the past, information was known by a select few. Looking to the future, integrated systems allow linking of multiple information systems to extract and transform information. The outcome will be enhanced health outcomes and improved public health capacity.

Because the PHIN to be used by all the public health system partners, it is important that the partners be involved in all processes that lead to the creation of the network. Systems don't just happen - rather they require deliberative focused processes with distinct vision in mind to build information systems. Leadership for network development must rest with an executive oversight committee to serve as the clearinghouse for communications, debate, discourse, decisions, innovation, and results-driven actions. Without a flexible governing structure that values collaborative partnerships, categorical approaches to data and information systems will dominate and precious resources, including time, will be lost.

PHIN must be viewed as a "system of systems." In order to ensure that critical data and functionality can be integrated, even if it is not hosted within its core infrastructure. There are many sources of data that are critical to public health that may be outside the traditional public health agencies and organizations (e.g., retail food, water quality, school health, and law enforcement). These systems and their owners must be partners in the creation of the integrated data and information system that will ensure timely delivery of public health services.

Outcomes:

Short-term Outcome Objectives (2002-2004)
By March 1, 2004, Wisconsin will establish the PHIN organizational framework necessary for the successful implementation of an integrated electronic data and information system, a key infrastructure priority of *Healthiest Wisconsin 2010*.

By 2004, Wisconsin will develop a framework that: (1) standardizes the collection and tracking of data (including demographic and socioeconomic data) for the 11 health and 5 infrastructure priorities; (2) uses and links to existing, established information systems; and (3) complies with state and federal regulations and security requirements.

Medium-term Outcome Objective (2005-2007)
By 2007, there will be an increase in the number of individuals and organizations using information from PHIN.

Long-term Outcome Objective (2008-2010)
By 2010, Wisconsin will have deployed an integrated electronic information system, PHIN, which measures public health system capacity and provides meaningful information on Wisconsin's 5 infrastructure and 11 health priorities for individuals and organizations to improve the health of Wisconsin's population.

Outputs: *(What we do -- workshops, meetings, product development, and training.)*
Accomplishment of this priority and these objectives is not a linear process, although some things need to be implemented earlier than others. While the Department of Health and Family Services has the statutory responsibility to create a public health data system, much of the data is created in systems outside the Department. It is critical that mechanisms be developed to integrate these various information systems. The "Inputs, Outputs, and "Participation/Reach" that follow transcend all objectives. Achieving the medium and long term objectives is directly linked to the groundwork laid by implementing the short term objectives. This plan describes what the *Healthiest Wisconsin 2010* Integrated Data Sub-Committee believes to be the necessary components of oversight and standardization to create this system of systems. There are many different project methodologies that can be used to successfully create information systems. Appendix C provides an example of one methodology.

Organization and Management:

- Create organizational structures within public health system partner organizations that will allow for successful management of public health information network activities as shown in Appendix A.

- Establish a statewide PHIN executive oversight committee. This committee should consist of representatives of the *Healthiest Wisconsin 2010* partners and should represent all public health system partners, both traditional and nontraditional.
- Establish program teams comprised of both technical and public health experts whose tasks include managing the sub-projects as approved by the executive oversight committee.
- PHIN activities include, but are not limited to: (1) staffing, recruiting, and/or appointing staff to the project teams; (2) commitment of resources by the *Healthiest Wisconsin 2010* partners to manage and sustain the project; (3) identifying and categorizing key stakeholders; (4) establishing a project portfolio that will be added to, as sub-projects are approved; and (5) establishing an architectural blueprint that will depict the integrated systems from both a public health and data perspective. The blueprint will be updated each time new components are added or updated, ensuring a current view of PHIN.
- Coordinate activities with the implementation of the *Healthiest Wisconsin 2010* objectives as documented in the Robert Wood Johnson Foundation Wisconsin Turning Point Grant that include:
  - Select and disseminate to the public health system partners a validated state-level minimum data set to measure and track progress for at least 75 percent of the outcome objectives for the 11 health priorities set forth in *Healthiest Wisconsin 2010* using scientific, interdisciplinary, and collaborative leadership approaches.
  - Select and disseminate to the public health system partners a validated companion local-level minimum data set to measure and track progress for at least 60 percent of the outcome objectives for the 11 health priorities set forth in *Healthiest Wisconsin 2010* using scientific, interdisciplinary, and collaborative leadership approaches.
  - Identify gaps, select local community measures, and determine how measurements will be developed where no local or statewide minimum data sets exist, and disseminate findings and recommendations to Wisconsin's local health departments and their community partners. (Note: This will include consultations with the Washington Department of Health regarding over-sampling procedures/processes used to determine local data).

Data Standardization:

- Establishing overarching standards is critical because PHIN is a "system of systems." (A basic set of standards and best practices to ensure interoperability, usability, security, data integration, maintainability, and supportability.)
- The director and staff will propose standard definitions and measures to be used in all system activities and will be approved by the executive oversight committee.
- The executive oversight committee will establish overarching standards and best practices for all system activities.
- The program team will create, publish, and use standard definitions and measures to be used in all system activities.
- Input sources for this step must include the consideration of existing standardized elements/systems such as:
  - National Electronic Disease Surveillance System
  - Health Alert Network
  - Department of Health and Family Services common core data standards
  - U.S. census data
  - *Healthiest Wisconsin 2010* minimum data sets

- Medicare/Medicaid and insurance standards
- Health Insurance Portability and Accountability Act
- Vital statistics (e.g., birth and death certificate data)
- Other national models/standards

Uses and Links to Existing Established Information Systems - Current State Assessment:
Produce a current state assessment to establish a "snapshot" of available data systems in Wisconsin to identify gaps, overlaps, and opportunities for integration. (Planning and decision making relies heavily on understanding what *is*. This critical step is necessary to ensure success of an integrated electronic data and information system.) Parameters of this assessment are detailed in Appendix C.

State and Federal Regulations and Security Requirements:
- Document the state and federal regulations that will be used to develop this network (e.g., confidentiality and security agreements, role-based security, the National Health Insurance Portability and Accountability Act regulations). Discussion of security and privacy are in Appendix D.
- Document and publish the security requirements for the system.

Inputs:
The following list of inputs (i.e., what we invest – staff, volunteers, time money, technology, equipment, etc.) is appropriate for all outcomes and activities for this infrastructure priority. Each input listed may be called upon during various stages of implementation – or they may be involved in every step, depending on the need.
- Wisconsin Public Health Data Steering Committee
- PHIN program director, advocacy team, executive oversight committee, and program team
- Division of Public Health staff
- *Healthiest Wisconsin 2010* partners
- Local health departments
- Tribes and Great Lakes Intertribal Council
- System users
- Data Expert Advisory Workgroup
- Resources from private sector, public sector, non-governmental sources (e.g., Robert Wood Johnson Foundation, Blue Cross/Blue Shield Foundation)
- Resources from existing standardized systems
- Sub-project stakeholders, users, and teams
- Help desk staff
- Public health preparedness grants
- Public Health Preparedness Information Technology Advisory Committee
- Robert Wood Johnson Foundation grant

Participation/Reach:
The following list of participants and reach members/organizations (e.g., community residents, agencies, organizations, elected officials, and policy leaders) is appropriate for all outcomes and activities for this infrastructure priority. Each member/organization listed may be called upon during various stages of implementation.

- System users
- Community HMO
- Health care providers
- Division of Public Health
- Local health departments and boards of health
- American Indian Tribes
- Legislators
- Individuals, communities, and organizations
- Department of Health and Family Services
- *Healthiest Wisconsin 2010* partners
- Other state governmental agencies (e.g., Department of Natural Resources, Department of Agriculture, Trade and Consumer Projection, Department of Transportation, Department of Emergency Management)
- Media

Evaluation and Measurement

The following measurements will be conducted to evaluate the effectiveness of the PHIN:

***Measurement*:** Does the system have the capacity to track the 5 infrastructure and 11 health priorities of *Healthiest Wisconsin 2010*? Does the system have the capacity to contribute to the measurement of the 3 goals of *Healthiest Wisconsin 2010*?
Evaluation*:* Determine functionality successes and failures.

Measurement: Has the time and cost to obtain timely and relevant data decreased?
Evaluation: Determine if the data are easy to access and manipulate. Determine if funding streams have changed in support of PHIN (e.g., Have technology resources been applied to building linkages to the PHIN or have public health system partners continued to build separate, non-integrated systems?). Compare prior costs of conducting business practices with costs after PHIN is developed.

Measurement: Is the public health system using data derived by PHIN to guide their programs and policy decisions?
Evaluation: Determine how data are being used and by whom (including government, public, private, nonprofit, and voluntary sector partners. The number of hits per month will be graphed, and user access tracked. Track the number of different data systems added to the system annually. Determine the number of local communities who (1) use the network for community assessments, (2) the number of hours to complete an assessment, and (3) are data provided by the network improving progress toward intervention and outcome. Determine if program-based databases have become more efficient by being part of PHIN (e.g., such as the Wisconsin Immunization Registry, SPHERE.)

Measurement: Is the system adequately tracking the 5 infrastructure, 11 health priorities, and the 3 overarching goals? Is a better tracking system leading to improvements in health outcomes?
Evaluation: Determine how data are being used and if improvements in the 11 health priorities are occurring.

Crosswalk to Other Health and System Priorities in Healthiest Wisconsin 2010

Meaningful, timely, reliable, and valid data supports decision making, and assists in measuring and tracking progress. Note: To ensure that the health and infrastructure priorities are interdependent and do not evolve into categories, the following points are essential:

- Since it will take several years to plan, build, test, and implement PHIN, the 16 *Healthiest Wisconsin 2010* priorities will need to rely initially on existing information systems to gather baseline data and track progress. These priorities should not rely on PHIN to define what data should be collected (e.g., how to measure socioeconomic factors).
- Standardization of data collection, such as who collects what data and in what format, will need to be determined early. Use of the architecture will depend on the system flexibility and robustness. The PHIN executive oversight committee will want to include input from the public health system community as part of the assessment.

Connection to the Three Overarching Goals of Healthiest Wisconsin 2010

The overarching goals of eliminating health disparities, promoting and protecting health for all and transforming Wisconsin's public health system are underpinned by PHIN.

Promoting and Protecting Health for All:

PHIN contributes to promoting and protecting the health for all by:

1. Collecting specific data that are currently missing or partially collected in non-standardized formats.
2. Supporting tracking systems designed to measure statewide and local data directly linked to Healthiest Wisconsin 2010 and the Local Data Package.
3. Ensuring current, reliable data that cuts across disease, illness, injury, disability, birth, and death, and also includes sociodemographic and health status data.

Elimination of Health Disparities:

PHIN supports the elimination of health disparities by:

1. Ensuring consistency in the collection of race and ethnicity data across all public health programs and activities carried out by government, the public, private, nonprofit, and voluntary sectors. (Note: collection of ethnic and racial data are paramount. However, it will be important to achieve consensus on the definition of "health disparities" and its parameters (e.g., rural, urban, age, and sex.)
2. Improving existing surveillance systems for collecting race and ethnicity information.
3. Using the Behavioral Risk Factor Survey to inform policy and programmatic efforts.
4. Collecting race/ethnicity data in all utilization of health services assessments.
5. Including health data indicators among combinations of social and economic characteristics (e.g., race, ethnicity, income, education, and occupation) in all future state reports on mortality, morbidity, and health behavior.

Transforming Wisconsin's Public Health System:

PHIN will help Wisconsin track the prevention efforts on the front end that make a difference in disease, death, and disability, while not losing sight of the special populations for whom the burden is greatest. The outcome will be improved health of the population of Wisconsin and improved public health system capacity - resulting in transforming Wisconsin's public health system.

Key Interventions and/or Strategies Planned

Key strategies planned for development and continuation include:

Educating and training participants and stakeholders: Education is needed about PHIN and the power and potential use of information this system can generate across all public health system disciplines, the general public, elected and organizational leaders, and among all of Wisconsin's public health system partners. -

Securing long term funding through the legislature: The Wisconsin State Legislature plays an important role in the success of PHIN because through sustainable funding and support the health of the Wisconsin public will be protected and costs will be saved due to anticipated efficiencies to connect data and information systems. As professionals and residents generate interest in the concept, momentum in Wisconsin will continue to build and influence the need for sustained financial support for public health system infrastructure.

Changing the way government and others carry out business practices by:

- Providing secure access to appropriate and relevant information.
- Decreasing hours and frustration in trying to obtain current data.
- Enabling a more informed public (e.g., health system partners, the public, state and local elected officials).
- Providing reliable fiscal impact data related to health, conditions, injury, and disease.

Conclusion

The potential that results from an integrated electronic data and information system that PHIN provides is tremendous. With thoughtful consideration, broad and creative marketing, education ~~to~~ of all users, buy-in from the public and elected officials, and securing sustained funding from multiple sources Wisconsin's PHIN will become a reality. Public health must take the lead on creating, building, and sustaining capacity to carry out the core public health functions and essential public health services called for in Wisconsin's state health plan *Healthiest Wisconsin 2010*. Capacity will require multiple resources including human, informational, financial, policy, and organizational. Access to reliable, valid, timely data and information is critical to a results-driven public health system.

References:

Centers for Disease Control and Prevention. (2001). What is Public Health Informatics All About? *Chronic Disease Notes and Reports.* 14(2), pp. 16-19.

Department of Human Health Services and the U.S Centers for Disease Control and Prevention. *Public Health Infrastructure*. (1999).

Gostin, L., O. (2001). National Health Information Privacy: Regulations Under the Health Insurance Portability and Accountability Act. *Journal of the American Medical Association.* 285 (23), pp. 3015-3021.

Hanrahan, L.P. (2001). *Health Alert Network and National Electronic Disease Surveillance System Presentation*. Communicable Disease Spring Seminar. Madison, WI.

Health and Human Services Federal Register. (2000).

Health Insurance Portability and Accountability Act. (2000). *HHS Federal Register*. 65(250).

Leean, J. (February 2001). *Administrative Simplification Provisions of the Federal Health Insurance Portability and Accountability Act of 1996*. Department of Health and Family Services. Madison, WI.

Marshall, S. (2000). Preparing for Bioterrorism in Wisconsin. *Communique.* p. 4.

Nation's Health. (2001). *U.S. Public Health Infrastructure Lacking*. 31(5), p. 4. American Public Health Association. (www.phppo.cdc.gov)

Proctor, M., and Hanrahan, L.P. (July 2000). *Wisconisn Epidemiology and Laboratory Capacity: National Electronic Disease Surveillance System Assessment and Planning*.

Public Health Information Network: *A Work In Progress*. (May 2003). Partner Organizations, pp. 3-15.

Turnock, B. J. (2001). *Public Health: What It Is and How It Works.* Aspen. 2nd edition.

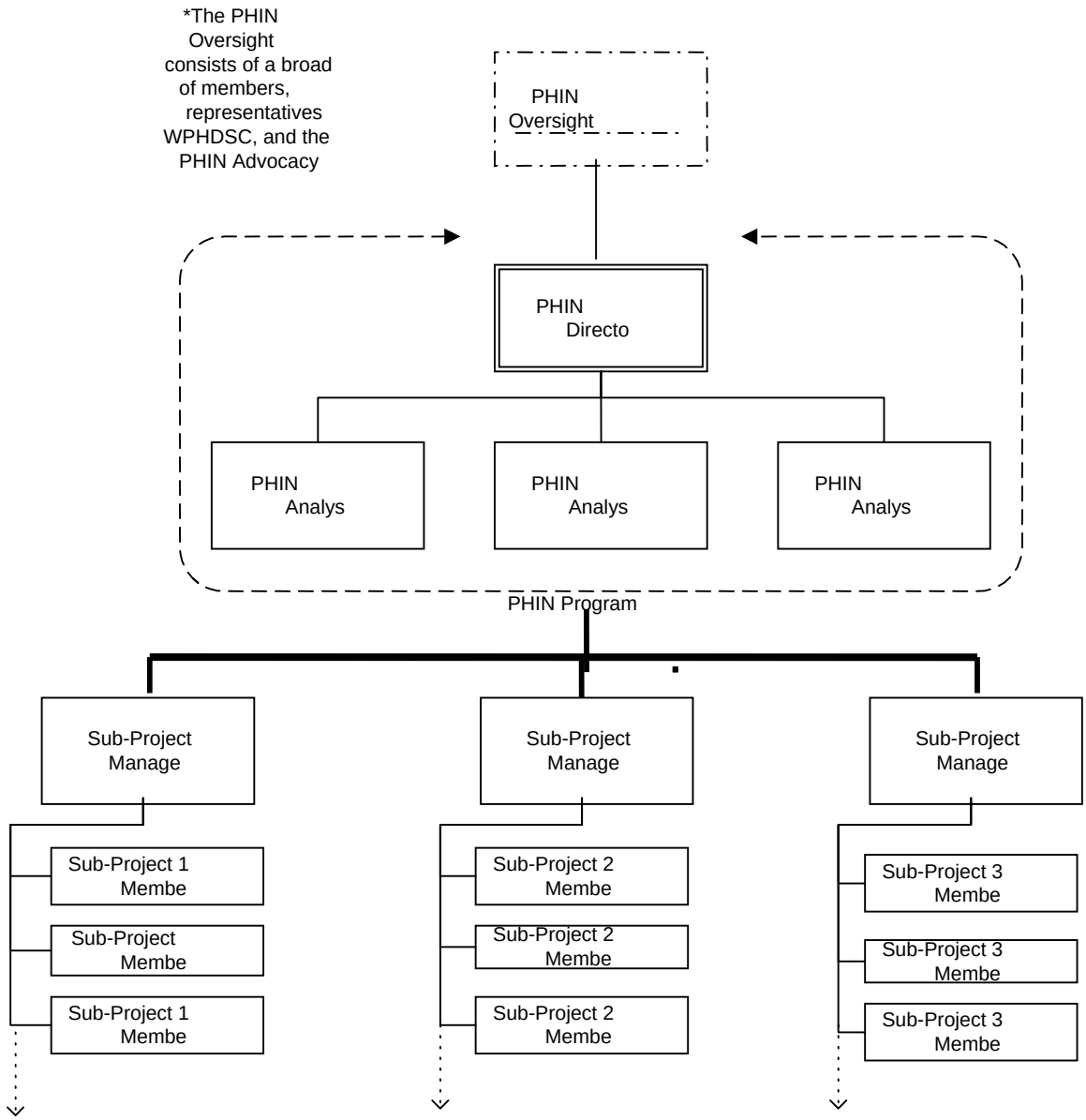
U.S. Department of Health and Human Services. Public Health Infrastructure. (November 2000). *Healthy People 2010: Objectives for Improving Health*. pp. 23-3; 23-9; 23-21.

Wisconsin Public Health Data Steering Committee Report: Its Vision, Mission, History, and Recommendations to the Division of Public Health. (Spring 2000). Wisconsin Public Health Data Steering Committee (author).

Wisconsin Public Health Information System Report. (May 2000). Wisconsin Public Health Data Steering Committee (author).

Appendix A

General Concept – PHIN Organizational Structure



Appendix B

Recommended PHIN Capabilities, Characteristics, and Related Issues

The Integrated Electronic Data and Information Systems Subcommittee recommends *system characteristics* that include the following:

- Expands the range of data available for more accurate decision making. For example, the integration of data from a variety of settings, such as health maintenance organizations and emergency rooms, hospitals, home care, and health departments in order to provide a better profile of health, injury, and illness.
- Provides statistical analysis, geographic information system (GIS) mapping, and surveillance analysis.
- Identifies the fit of alternative practice.
- Provides a system language and aggregate analysis that is easily used by end users.
- Ensures that business practices of governmental and non-governmental users can be supported.
- Develops a process that builds trust among partners and promotes information sharing.
- Provides for implementation and maintenance of training and project assistance for end users. This may include assistance in interpreting data, quality checks on reports prior to their public release, and referrals to appropriate health or data experts as may be needed.
- Prevents double counting of multiple encounters/visits by a single client for accurate analysis.
- Supports diagnosis-related information as well as health indicator information across populations, including special populations.
- Supports individual, family, or group, as well as population-based information.
- Ensures local data are collected on the entire community, not just the users of the local health agency.
- Ensures local data are collected at the municipal level for community-specific assessment and planning, especially in Milwaukee County.
- Tracks the Wisconsin health and infrastructure priorities.
- Handles the diversity, specific-focused programs such as the Women, Infants, Children Program or the Lead Poisoning Prevention Program, while accommodating Medicaid and Medicare system data, hospitalization data, ambulatory care data, geographic indicators, race and ethnicity data, Behavioral Risk Factor Survey data, geo-coding, and insurance data.
- Adds value, saves money, decreases health costs, and reduces death and disability from diseases.
- Makes accurate, meaningful information available to a variety of end users, including local health departments, private agency users, and the general public.
- Provides for long term health analysis by maintaining data for longer periods of time.

The Integrated Electronic Data and Information Systems Subcommittee recommends *system capacity needs* that include the following:

- Data that captures business (work) processes, individual services, public health surveillance, and significant population-based public health impact.
- Workforce data tracked by categories of work settings and health care shortage areas.
- Surveillance data that may incorporate disease reporting, vital records, geo-coding, results from other agencies (e.g., Department of Natural Resources, the Environmental Protection Agency, Department of Transportation), laboratory test results, local environmental health data,

hospitalization discharge data, pharmacological effectiveness, and controlled access to client data.

- Prevention information that may include linkages to systems such as the Wisconsin Immunization Registry, health status, and health behavior information.
- Public health impact data that will include accomplishment of state public health priorities, core functions, essential services, best practices, community assessments, and public opinion surveys.
- Individual data that may include case management of lead-poisoned children, frail elders, new parents, and clients being treated for mental disorders.
- Access to information is controlled through security systems (Appendix D).
- Data elements that may include individual, family, groups and populations, geographic sites, encounters, symptoms, outcomes, activities, processes, diagnosis, and treatment and prevention activities.
- Municipal level data that is created for informed communities, since zip code and county level data are not specific to the majority of Milwaukee County municipalities.
- Systems that can grow (in terms of capacity: data and users).

Other Issues to be considered that may be opportunities or threats to PHIN based on a Strengths/Weaknesses/Opportunities/Threats Analysis:

- Confidentiality management (e.g., existing statutes and regulations on electronic data sharing, awareness of national trends).
- Decision by the Department of Health and Family Services to endorse a different strategy for data management and sharing.
- Lack of support by government or an emphasis on bureaucracy that impedes rapid implementation of a system could result in low participation by public health system partners, especially in the non-governmental sectors.
- It will be important that people who don't use the system routinely value PHIN as a tool for others.
- Insufficient funding, staffing, system maintenance, and/or project assistance to users could impede the progress of implementation and reduce the likelihood of success.
- Can government take a leadership role in building and maintaining PHIN, and also build the partnerships necessary for its success?
- Choosing what data sets to add to the system first will be crucial.

Appendix C

One Model for Consideration
Identifying Robust Elements by PHIN Executive Oversight Committee

Activity 1: Project Initiation
The Project Initiation activity will establish a management structure that will allow for the successful "scoping" and implementation of PHIN. This activity joins public health and technical expertise in order to ensure that the decisions and direction of PHIN will meet the needs of public health with robust and sustainable technologies.

Activity 2: Current State Assessment
The program team will take the lead to identify, describe, categorize, and prioritize existing Public Health systems.

The current state assessment activity establishes a "snapshot" of what Wisconsin has today. This snapshot will later be used to identify gaps, overlaps, and opportunities. Having a picture of what exists today will help the program team to understand how the systems interact, what systems are critical, where the systems connect, what data and business functions exist, and the systems' make-up. Planning and decision making relies heavily on understanding what "*is*" and this is a critical step necessary in ensuring the success of an integrated electronic data and information system. The current state assessment activity includes the following:

- Identify existing systems used for public health, including user base, key data elements, and technologies employed.
- Categorize existing systems according to the 11 health and 5 infrastructure priorities, and noting systems that do not serve these priorities.
- Identify major business functions served by each system in order to identify overlapping system functionality (e.g., licensing, inspection, surveillance, etc.).
- Identify any barriers to integration.
- Develop a current state data dictionary that can be used as a primary reference for data integration.
- Categorize systems as potential program area modules on the network, data integration options, or data translator options for existing systems that do not conform to the National Electronic Disease Surveillance System Conceptual Data Model.
- Assess each existing system to establish a baseline for tracking the 5 infrastructure and 11 health priorities.
- Identify overarching administrative systems.
- Report to the executive oversight committee on results of current state assessment.

Activity 3: Future State "Scoping"
The program team will determine the high-level scope of PHIN.

By using the results of the current state assessment (see Activity 2) and evaluating them against the vision for the network, the program team will be able to determine what it should include and how it should operate. The team will be able to identify gaps, redundancies, and inconsistencies in data and business processes that can be used to make decisions about the priorities and direction of the project.

The information obtained during future state "scoping" will be used to prioritize and launch sub-projects to build and integrate individual "sub-systems" in PHIN. New systems include individual program area modules or overarching functionality like reporting modules, analysis tools, mapping, health alerts, and others that are built on the PHIN technical infrastructure. Additionally, "systems" that are not part of the PHIN technical infrastructure will require interfaces so they may exchange data with other PHIN systems. By ensuring integration between systems that may be on independent technical architectures, PHIN becomes a truly integrated source of public health data and functionality.

Future state "scoping" considers business needs, data needs, funding, and grant obligations when determining priorities. In this way, the program team and the executive oversight committee can make decisions about which systems and functionality to create new, which to rebuild, and which to create integration interfaces for.

Additionally, the future state "scoping" activity establishes a project charter that will serve as the overarching direction setting document for PHIN. All new, rebuilt, or integrated components will be listed and prioritized. The project charter will be a "living" document and will be updated as more information is learned and the effort progresses.

Future state "scoping" includes the following:

- Examine the data needs of Wisconsin's 5 infrastructure and 11 health priorities.
- Compare existing systems to data needs to identify redundancies, gaps, and inconsistencies in data.
- Identify targets of opportunity to decrease costs and increase benefits.
- Secure input from all stakeholders to determine data and systems desired (ongoing).
- Secure input from all stakeholders to determine priorities for integration from a public health perspective (ongoing).
- Secure input into priorities with regards to grant obligations and funding (ongoing).
- Determine if any changes in policy, process, or statute is needed to allow for integration (ongoing).
- Develop a project charter that includes vision, scope, and high-level timeline. Scope must include what's in, what's out, what's funded, and what has to wait (ongoing).
- Report to the executive oversight committee on the proposed charter and priorities (ongoing).
- Adjust the project charter in accordance with executive oversight committee input (ongoing).
- Hold bi-monthly status meetings with the executive oversight committee (ongoing).

Activity 4: Establish Project Structure and Approach
The program team and executive oversight committee will establish an overall project structure to ensure best practices are employed in all system activities (e.g., scheduling/planning, appropriate communications, risk management, fiscal monitoring, software development, contracting, purchasing).

By developing an overarching approach for dealing with core project components, the program team will ensure consistency in the management of PHIN and all its sub-projects launched as part of PHIN.

To ensure that project status is reported in a timely and uniform fashion to all stakeholders, a communication plan will be developed for the network and all sub-projects. Risks will be managed using a common approach to ensure that risks across sub-projects are managed effectively and key decisions are made when project constraints are pushed. Budgeting will include breakouts for components that are common across sub-projects, as well as accommodating areas unique for each effort. Development, contracting, and purchasing guidelines will be established to ensure consistency across potential solutions.

Establishing a project structure and approach is critical to effective decision making and project management activities in PHIN and its sub-projects. This activity includes the following:

- Create a high level project timeline that identifies the systems/programs to be integrated and high level target dates for initiation and completion (ongoing).
- Create a communications plan to be used to keep stakeholders informed on progress (ongoing).
- Develop the structure detailing roles and responsibilities for the project (ongoing).
- Work with the advocacy team to promote public, private, and academic partnerships in the development, use, and sustainability of PHIN (ongoing).
- Adopt a methodology, complete with deliverable templates, for integrating applications. The methodology must include checkpoints to ensure that specific areas have been addressed, such as legal, help desk, etc. (ongoing).
- Establish and/or adopt processes and agreements (e.g., memorandums of understanding, contracts) for maintenance, support (help desk), and continued process improvement for all system components. These processes and agreements may need modifications depending on the needs of the project, but a general template and structure should be followed to ensure consistency across all system components (ongoing).
- Deploy individual projects and project teams based on the priorities established in the scoping activities (ongoing).
- Create and maintain data dictionaries for each integrated system (ongoing).
- Create a risk management plan that will identify and rank potential risks to the project and describe mitigation strategies and contingencies (ongoing).
- Establish a plan for continuous improvement, including user satisfaction surveys (ongoing).

Activity 5: Project Analysis Phase - Establishing Overarching Standards
The program team will establish overarching standards and best practices for all system activities, including program area modules' development and system integration interfaces.

Because PHIN is a "system of systems," it is important all integrated "systems" follow a basic set of standards and best practices. These standards and best practices will ensure interoperability, usability, security, data integration, maintainability, and supportability.

Establishing overarching standards includes the following:

- The program team will adopt, publish, and maintain data standards for the Wisconsin Public Health Information Network. Input sources for this step must include the consideration of existing standardized elements/systems such as:
  - National Electronic Disease Surveillance System
  - Health Alert Network
  - Department of Health and Family Services common core data standards
  - U.S. census data
  - Minimum data sets
  - Medicare/Medicaid and insurance standards
  - Health Insurance Portability and Accountability Act
  - Vital statistics (e.g., birth and death certificate data)
  - Other national models/standards
- The program team will create standard definitions and measures to be used in all system activities.

Activity 6: Project Analysis Phase -- Business Analysis for Sub-Projects
Individual sub-project teams and workgroups will do detailed business analysis to ensure business needs/requirements are collected to a degree that infrastructure can be established/enhanced and software can be procured or developed.

Detailed business analysis requires the involvement of all stakeholders in defining the needs of the system. Stakeholders will work with a PHIN business analyst to describe, in detail, the business process flow, what goes into the system (e.g., data entry, file uploads, etc.), how the system should work, and what comes out of the system (e.g., reports, data exports, etc.). These requirements define the business and are not generally technical in nature. They tell the technical designers and programmers what the system needs to do in order for it to be useful to the users, and they serve as a measurement for successful implementation.

By ensuring key stakeholders are involved in defining the business requirements of the system, the program team and sub-project team will ensure the system is usable and it includes the functionality necessary to meet the needs of public health.

Each sub-project will gather the business requirements necessary for their effort, following the best practices and standards established in Activities 4 and 5. The executive oversight committee will approve and prioritize sub-projects and maintain oversight of each sub-project to ensure consistency and compliance at a higher level and across sub-projects.

Business analysis for sub-projects includes the following:

- Individual sub-project teams will identify and define the major business (work) processes as related to their project. These major business processes will be compared to information collected during the current state assessment to identify overlaps, areas requiring business process re-engineering, and areas of opportunity for integration in both business process

and data (ongoing).
- Identify stakeholders for the sub-project (ongoing).
- Create a project charter (e.g., communication and risk plans) for the sub-project (ongoing).
- Drill down within each of the business areas to define detailed specifications of processes and data (ongoing).
- Incorporate recommended system capabilities and system characteristics detailed in Appendix B (ongoing).
- Obtain maintenance, enhancement, and help desk support requirements and begin modifying standard agreement templates if needed (ongoing).
- Lead workshops with system user groups to collect complete and accurate business requirements for the sub-project (ongoing).
- Create a business requirement document defining timeline, budget constraints, deliverables, and business requirements (ongoing).
- Make recommendation to the program director and PHIN executive oversight committee to build it, procure a commercial solution, or contract with a vendor to build it (ongoing).
- Meet with the program director and PHIN executive oversight committee to review requirements and gain approval of the sub-project. Only approved projects will proceed to procurement or design (ongoing).
- The project charter and business requirements documents will become part of the project portfolio (ongoing).

Activity 7: PHIN Support for Minimum Data Sets
Establish and maintain an infrastructure for the reporting and tracking of the state and local minimum data sets.

One of the key measurements for determining the success of *Healthiest Wisconsin 2010* will be to track and report on the minimum data sets identified for the 11 health and 5 infrastructure priorities. The ability to compare new numbers against baseline data is critical to knowing whether or not the efforts of *Healthiest Wisconsin 2010* have truly improved the health of Wisconsin.

This activity builds the technical infrastructure necessary to ensure that the data can be tracked and reported, and this functionality can be maintained through the years. Public health professionals will be able to quickly and easily measure their results on an ongoing basis and will be able to adjust their programs and outreach activities accordingly.

Building support for the minimum data sets includes the following:

(Robert Wood Johnson Foundation) Once the state and local minimum data sets are completed, the Division of Public Health will contract with Public Health Preparedness Information Technology Advisory Committee for programming services to build upon existing infrastructure in order to:

Objective 1: Design and implement, on the Health Alert Network, a National Electronic Data Surveillance System compatible reporting system to track the baseline data for the state and local level minimum data set for the health priorities set forth in *Healthiest Wisconsin 2010* and provide training to the partners.

Objective 2: Institutionalize and sustain the continued implementation, on the Health Alert Network, a National Electronic Data Surveillance System compatible reporting system to track the baseline data for the state and local level minimum data set for the

health priorities set forth in *Healthiest Wisconsin 2010.*

Activity 8: Sub-Project Technical Design Phase
Each sub-project team (approved projects only) will produce a technical design document for their sub-project that is based on the standards and best practices established by the program team and will meet the business requirements defined in the business requirements document.

How a system is designed technically is critical to ensuring the success of the system. This phase works through the technical aspects needed to meet the business requirements of the system and also be secure, robust, supportable, and maintainable. Since a poor technical design can manifest itself in many ways, including poor performance, significant downtime, unusable interfaces, high support costs, and poor data quality, it is important that the program team reviews the technical designs for all sub-projects.

Additionally, the technical design document defines how the system and data will be integrated with other systems or components. If integration is not built into the system on a technical level, it can be difficult and costly to accommodate integration after the system is built.

For systems that do not share the PHIN technical architecture, the technical design phase will include defining how the system and data will interface with other public health systems in order to ensure integration.

The sub-project technical design phase also includes planning efforts for testing and training within each sub-project. This planning is essential to ensuring the usability of the system by all users.

The sub-project technical design phase includes the following:

- Create a technical design document that includes data structure definitions, performance criteria, backup, and security requirements. Technical design should also include a migration strategy for moving legacy data to new systems. For procured, off-the-shelf solutions, the technical design document will focus only on the integration components. For custom developed solutions, the vendor may be called upon to produce the technical design document based on a standard template provided (ongoing).
- Build a detailed development plan, including costs, timelines, release cycles, and functionality (ongoing).
- Begin record retention planning, and creation of a testing plan and a training plan (ongoing).
- If applicable, develop a prototype of the system (ongoing).
- Establish/expand public and private workgroups for design validation and/or prototype review (e.g., expand the Wisconsin Public Health Data Steering Committee to include private sector).
- Update the project charter if needed (ongoing).
- Revise sub-project timeline and budget as needed (ongoing).
- Update the program team on sub-project progress and budget/timeline changes; and get approval to move forward (ongoing).
- Check in with the program team after completion of each phase (ongoing).

Activity 9: Project Construction, Testing, and Implementation Phases

Each sub-project team will develop the system or parts of the system according to the technical design document and meeting the requirements identified in the business requirement document. For procured systems, development may not be necessary, but construction of integration components will be required.

The building, testing, training, and implementation of each sub-project is essentially adding functionality to the public health system. While each sub-project focuses on its primary function (e.g., maternal and child health, newborn hearing, West Nile virus, health alert functionality), the project construction, testing, and implementation phase is where all the individual systems come together to make an integrated system (e.g., a system of systems). Code is written, data is migrated, and components and data are integrated. The systems are tested, including inter-dependencies where functionality is shared, and users are trained so they can fully use the system and understand how what they are doing will impact other areas.

Project construction, testing, and implementation includes the following:

- Build the system or integration components (ongoing).
- Unit-test each component as it is built or modified (ongoing).
- Finalize the test plan for system and acceptance testing (ongoing).
- Implement the test plan (ongoing).
- Obtain system acceptance sign-off (ongoing).
- Finalize the training (and outreach) plan (ongoing).
- Build an implementation plan, including a help desk support strategy (ongoing).
- Implement the training and implementation plans (ongoing).
- Finalize the modification of the maintenance, enhancement, and help desk agreements as needed for the application; institute the agreements/processes (ongoing).
- Update the project portfolio with current project deliverables (including an updated charter, final budget, test plan, implementation plan, etc.) (ongoing).
- The program team will evaluate the system and user satisfaction. The satisfaction survey will become part of the project portfolio (ongoing).
- The program team will update the systems blueprint to include the new system (ongoing).
- The advocacy team will continue to implement the marketing and publicity plan (ongoing).

Activity 10: Continuous Improvement and Maintenance

The executive oversight committee and the program director will lead the efforts to ensure a long life for all system components; recommending updates to older technologies, accommodating changing needs in public health, and leveraging new technologies.

The rapid changes and advancements in technology make planning for continuous improvements and maintenance imperative. The life cycle for any technology (hardware or software) is relatively short. This means that over the t10-year plan the program team will need to continually monitor the industry to make sure that PHIN is as current as possible. Plans for replacing outdated technologies and leveraging new technologies will need to be created and implemented.

Additionally, PHIN will need to accommodate changes in the business and data needs of public health. New diseases, new treatments, new threats, and new cures must be considered as the State Health Plan unfolds.

Continuous improvement and maintenance includes the following:

- Develop a plan for continuous evaluation of system components, including assessments against health priorities to ensure health improvement in Wisconsin.
- Plan for record retention.
- Maintain currency on emerging technologies.
- Maintain relationships with stakeholders and users to accommodate changing needs.
- Plan for ongoing organizational, fiscal, and staff support.
- Plan for an ongoing cycle of equipment replacement and software upgrades.

Appendix D

Assuring PHIN Security and Privacy

Modern information technology ensures improved security and privacy. An integrated public health information system containing at least some individually identifiable health information raises issues of information security and privacy. Technology exists to address these issues. Connecting multiple systems starkly poses the question of how to match or link records regarding a single person or public health incident together. Authorizing access to health data on this scale is not a solved problem. To succeed, the program team will have to address these issues very early on, *before* proposing a design for our public health infrastructure. PHIN will provide for far better security than what we currently have.

Security Considerations
Computers connected to the general Internet can easily exchange information. It will be necessary to deploy completely new operating systems and applications designed from the ground up with security in mind. It may also be necessary to segregate highly sensitive network traffic on private networks, as the U.S. Department of Defense does with their military network. Any confidential health information stored on internet-accessible computer systems must be carefully monitored for intrusion or inappropriate access. The Health Insurance Portability and Accountability Act is establishing new security standards that will shore up security breaches in the private sector.

Throughout the development and deployment of the PHIN, a variety of security measures will be necessary. Careful design and testing of applications with security considerations in mind is one part of this. Public health will comply with the Health Insurance Portability and Accountability Act standards even though it is not mandated.

Privacy Considerations
Privacy of individually identifiable health information is covered by a patchwork of state and federal laws and regulations, and has been a concern as long ago as the 1972 HEW Code of Fair Information Practices. A significant recent development is the Health Insurance Portability and Accountability Act (http://www.hcfa.gov/hipaa/hipaahm.htm). The Health Care Financing Association wrote privacy regulations to implement part of this act, which go into effect in 2003. Additional initiatives in this area include a Model State Public Health Privacy Act (http://www.critpath.org/msphpa/privacy.htm). A 1999 General Accounting Office Report found that current practices regarding health data were inadequate (GAO/HEHS-99-55 (Feb. 1999). Report to congressional requestors on Medical Record Privacy (http://www.epic.org/privacy/medical/gao-medical-privacy-399.pdf).

Re-use of data originally collected for treatment purposes for secondary public health goals runs counter to the privacy goals, but is an explicit recognized and necessary function of health information. Past experience with census data further indicates that even when only aggregated data is available, partial identifying information, plus an ability to run multiple statistical queries, can infer individual characteristics with surprising accuracy. This prospect may become increasingly complex as more health data are geo-coded.

Identification, Authentication, and Authorization

Three of the key security challenges a networked system of computers must deal with are identification of users, authentication of the presence of a user at a computer, and authorization of a user to access and modify specific data.

The goal of *identification* is to distinguish between users. Common names shared by multiple individuals, such as "John Smith," is problematic. Similarly, identical computer login names in different administrative domains often also represent different individuals.

Likely implications for PHIN include that:

1. Authentication will have to be based on multiple factors.
2. All communications will have to be encrypted.
3. Preferred authentication methods are likely to evolve considerably, so PHIN must support multiple methods simultaneously, and have the flexibility to accommodate new methods.

Appendix E:

Summary of Data Needs

Priority Subcommittee	Examples of Data Needs
Community Health Improvement Processes and Plans	Need baseline data and progress tracking. Need to support information sharing.
Coordination of State and Local Public Health System Partnerships	Need baseline data and progress tracking. Need to support information sharing.
Sufficient, Competent Workforce	Need to provide for enumeration of the public health workforce, including profession, race/ethnicity, and gaps and shortages.
Equitable, Adequate, and Stable Financing	Need to allow for identification of gaps and disparities by essential services. Provide a strong infrastructure to support identification of emerging public health concern. Allow for analysis of governmental and non-governmental funding and other resources.
Access to Primary and Preventive Health Services	Need data to track this priority, including elements of insurance coverage, employer demographics, coverage and co-pays, dental care, and barriers to care.
Adequate and Appropriate Nutrition	Provide information on resources and services, linkages to related health concerns, surveillance and disparities, and allow for geo-coding and information sharing.
Environmental and Occupational Health Hazards	Provide for food and water-borne disease tracking and outcomes.
Existing, Emerging, and Re-emerging Communicable Diseases	Provide for data to support control, follow up, surveillance, rapid communication, vital records, hospital data, geographic information system (GIS) of disease events, and identification of disease clusters.
High Risk Sexual Behavior	Need to collect baseline data and track progress. Need capacity for surveillance and evaluation.
Alcohol and Other Substance Use and Addiction	Provide a directory of resources and allow for the collection of baseline data and progress tracking. Need capacity for surveillance and evaluation.
Intentional and Unintentional Injuries and Violence	Need to collect baseline data and track progress. Need capacity for surveillance and evaluation.
Mental Health and Mental Disorders	Provide baseline and tracking data. Include information on the availability of screening services across multiple settings, treatment services provided, and enumeration of and scope of public health. Allow for information sharing.
Overweight, Obesity, and Lack of Physical Activity	Need to collect baseline data and track progress. Need capacity for surveillance and evaluation.
Social and Economic Factors that Influence Health	Need to collect baseline data and track progress. Need capacity for surveillance and evaluation. Need to develop social indicators for population health.
Tobacco Use and Exposure	Need to collect baseline data and track progress. Need capacity for surveillance and evaluation.