5.b. Recipient Activity b: Assessing State and Local Needs

Prioritize state and local needs related to tracking of health effects, exposures, and hazards with the goal of incorporating these data into an environmental public health tracking (surveillance) network. This effort should take into account gaps in types of health effect surveillance, environmental exposure, and hazard information systems currently available to the applicant, the timeliness of reporting, completeness (in terms of population, facility, locales covered), data quality, technical infrastructure, compatibility with NEDSS and EPA's National Environmental Information Exchange Network, inclusion of data elements that would allow linkage to data sets, and stakeholders' needs (see Appendix IV for Guidance for Preliminary Inventory and Future Assessment of Health Surveillance and Environmental Monitoring Information Systems). The applicant may refer to (PACE EH) for examples of how to generate citizen input. (Appendix II).

5.b.1. Results and Accomplishments

Our needs assessment activities were separated along four concurrent tracks. Although each is related and there are common themes and findings, each track is reported separately in this section.

The first track (Needs Assessment of Data System Owners) investigated the requirements of an EPHTN relative to central reporting surveillance systems. Central reporting surveillance systems tend to be the primary agencies with jurisdiction and mandate to collect, centralize, and maintain environmental and health monitoring information on a statewide basis.

The second track (Drinking Water Needs Assessment) investigated data gap issues in tracking drinking water contaminants.

The third track (Stakeholder Needs Assessment) investigated needs, issues, priorities, and perceptions related to EPHT for other stakeholders (local public health agencies, non-governmental organizations, and tribes/tribal agencies). These stakeholders are typically consumers of data, although in some cases they also report data to the data systems.

The fourth track (Alameda County Pilot Project Advisory Group Assessment) investigated general issues and needs for environmental health information in relation to the Alameda County Pilot Project. The input was gathered over the course of five advisory group meetings.

Needs Assessment of Data System Owners

The assessment of requirements of surveillance system owners was initiated through Future Assessment activities and was carried out by our contractor, Synergy Consulting, Inc. The purpose of the Future Assessment was to describe the capability of health and environmental data system owners to incorporate their existing surveillance and monitoring data infrastructure into the EPHTN in the future. Future Assessment activities were divided into two phases, in which the initial phase (APPENDIX D: Phase 1 Future Assessment Report) examined more general elements of a wide selection of environmental and health data systems, while the final phase (APPENDIX E: Phase 2 Future Assessment Report) examined more detailed elements of a more narrow selection of data systems and included a face-to-face meeting between data owners and CEHTP staff.

The first phase of the Future Assessment examined characteristics of 20 environmental and health surveillance systems that cover the California domain. These characteristics include: description, purpose, age, size, reporting frequency, data currency, confidentiality, geographic specificity, data collection process, quality assurance/control/reliability, transfer capability, IT principals, planned enhancements, and areas for additional assessment/discussion. Some dominant themes emerged from this phase. For example, all data systems that were surveyed responded and indicated their willingness and oftentimes enthusiasm for having the opportunity to collaborate with our program. Many health surveillance systems indicated that confidential data would require authorization from Human Subjects Committees. For environmental monitoring systems, there are opportunities for accessing more timely and less aggregated unofficial data before it is prepared for official release through quality assurance/control and summarizing functions. Environmental and health data systems acknowledged the benefit of ongoing and automated standards-based data sharing.

The first phase of the Future Assessment included a criteria-based ranking that assisted us in narrowing down the list of data systems for follow-up in the second phase. These criteria were: data critical to environmental health analysis, spatial specificity by which environmental or health event data can be geographically linked to a corresponding health or hazard event, and the timing for the availability of official and unofficial data.

The following California state data systems (and Federal, where noted) participated in the second phase of the Future Assessment.

HEALTH SYSTEMS:

- California Birth Defects Monitoring Program Registry (CBDMP)
- California Health Interview Survey (CHIS)
- EUREKA (California Cancer Registry)
- Medical Care Statistics Section Database (MCSS)
- Patient Discharge Database (PDD)
- Automated Vital Statistics System (AVSS)

ENVIRONMENTAL SYSTEMS:

- Aerometric Data Analysis and Management System (ADAM)
- California Emissions Inventory Development and Reporting System (CEIDARS)
- Highway Performance Monitoring System (HPMS)
- Pesticide Use Report Database (PUR)
- USEPA Toxics Release Inventory (TRI)
- Water Quality Monitoring Database (WQMD)

The second phase of the Future Assessment included discussions with system owners, reviewing systems documentation, and consolidating individual system strengths and weaknesses. One objective of these meetings was to identify areas of collaborative opportunity to create or enhance data exchange infrastructure. Another objective was to identify internal and external information technology governance protocols, procedures, and oversight organizations, which ultimately influence data sharing agreements and technology. Dominant topic areas applicable to the gamut of system owner discussions emerged from this evaluation. Since the concurrent analysis of environmental and health information often hinges on questions of geographic interoperability, discussions often centered on Geographic Information System (GIS) capacity and resources. System owners were queried to identify areas for collaboration that would result in establishment or enhancement of GIS functionality within their system domain. Discussion also addressed approaches to overcoming data sharing challenges. In addition, a process for establishing ongoing communication with our program was evaluated for each data system.

Listed below are categories with the most variation (in terms of strengths and limitations) among the selected monitoring systems that participated in the second phase of the Future Assessment:

- Geographic Specificity – The geographic specificity of data content that promotes accurate and feasible linkage to corresponding health and environmental monitoring events.
- Data Confidentiality – Restrictions on the ability to disseminate confidential data.
- Collaboration – The specific parties involved and the willingness of those parties to participate in our program.
- Data Exchange – The current and future ability to electronically exchange data through systematic and standards-based flow mechanisms.
- Data Availability – The timely receipt and validation of health and environmental monitoring events.
- Data Completeness – The completeness of data within each record and the receipt of the universe of available records.
- Data Specificity and Quality – The inclusion by the data of levels of detail necessary to support analysis within the database itself and integrated with other databases.
- System Enhancements to Support CEHTP – The consideration of the goals of our program when planning and implementing enhancements.

Following the completion of Future Assessment activities, we identified a number of key requirements that we do not control, but should be satisfied. In this respect, the single most important need that we have from data system owners is that they implement the standards prescribed by the corresponding environmental and health national data interoperability initiatives: NEIEN and PHIN, respectively. This would greatly increase the ability for a surveillance system to provide high quality and timely environmental health data that are efficiently discovered and consumed in a disparate network setting. The shared specifications of NEIEN and PHIN are also of interest to us. The most important specifications that would directly benefit an EPHTN are:

- Standard data messaging mechanisms (e.g. Exchange Network Node & Web Services, PHIN Messaging System).
- Electronic messaging flows between local, state, national, and laboratory reporting entities as well as lateral cross-jurisdictional flows (e.g. state-to-state, local-to-local, agency-to-agency).
- Metadata standards and services.
- Analysis, visualization, dissemination and report-generation services.
- Security and role-based framework.

We can influence the interest and capacity of a data system owner to implement the national data interoperability initiatives. We believe this facilitation can result from and, at the same time, spawn the need for partnering with data system owners in content- and functionality-type enhancement projects. Partnerships that aim to improve data quality, completeness, and timeliness as well as working toward enhancing electronic interoperability can lead to trusted and ongoing data-sharing relationships. System owners have agreed on this point, stressing the need for ultimate control over their system functionality and content. Data system owners have also described an operating environment where there is lack of resources, capacity, and mandate to accomplish the enhancements that would make their data products more useful in an EPHTN context. Taking this reality into account, we should assist data system owners in providing the evidence that would justify enhancement projects. Subsequent to that, we should provide system owners technical assistance in areas where they lack capacity or resources. We should invest heavily in expertise and access to value-added services not already addressed by NEIEN or PHIN specifications. We should work closely with data system owners to identify services that are mutually beneficial for incorporating into their system content and/or functionality. Some of the services and products that we aim to directly provide or assist data system owners in implementing are:

- Real-time address validation, standardization, and geocoding services (see SECTION 5.f - Recipient Activity f: Training/Tools for Surveillance and Related Issues on p93).
- Enterprise spatial and temporal integration services.
- Spatially-enabled database hosting.
- Probabilistic text-based linkage services.
- Map publishing services (Web Map Services).
- Spatial feature publishing services (Web Feature Service).

- Simple client web application programming interfaces (Web API) for each of the aforementioned services.

Drinking Water Needs Assessment

Our IT/GIS Manager, Craig Wolff, also assessed the state's capacity to track contaminants in drinking water. He presented the problem of integrating drinking water quality monitoring data with health surveillance data in 6 separate forums (see APPENDIX S: Tracking Drinking Water Contaminants). The two overarching issues in California that prevent successful tracking are:

- There is lack of a state centralized system or database for systematically determining the water supplier to an individual, residential community, or workplace.
- Contaminant concentrations often change between the time/location of sampling and the time/location of consumption.

A number of methods have been developed that take into account water system configuration and operation so that samples can be adjusted to better reflect concentrations that might exist at the point of consumption. For the majority of water systems and individual contaminants, treatment and dilution have the most pronounced effect on concentrations after sampling. We have identified the need for closer communication with other states and water systems as a strategy for bridging the water quality tracking data gap.

Please see SECTION 5.c - Recipient Activity c: Develop Partnerships on p65 for our efforts related to developing partnerships to address these findings. The assessment results were also incorporated into a supplementary project proposal to CDC (see APPENDIX S: Tracking Drinking Water Contaminants).

Stakeholder Needs Assessment

A critical component of the planning process was a needs assessment of environmental health tracking stakeholders, including but not limited to: non-governmental organizations (NGOs), local public health agencies (LPHAs), and tribal governments and agencies. The goal of our stakeholder needs assessment was to identify, document, and communicate stakeholder needs, issues, and concerns related to an EPHTN.

To that end, the Needs Assessment and Outreach Workgroup of our Planning Consortium was convened to assist in the development and implementation of a needs assessment strategy. See APPENDIX A: Partners that Contribute to or Support the Program for a list of the Needs Assessment and Outreach Workgroup members. Needs assessment findings have informed and shaped our approaches and activities during the development stages of an EPHTN. Ultimately, findings from the needs assessment will be used to inform the strategic plan for environmental health tracking in California. This includes community outreach and involvement strategies,

data/information communication and dissemination strategies, data analysis and interpretation methods and priorities, and technical specifications for an EPHTN.

Objectives of the needs assessment include identifying and documenting:

- Environmental hazards/exposures and diseases of concern.
- Priority data and information needs.
- Needs and issues related to working with environmental health data[3].
- Needs and issues related to utilizing environmental health data for public health action.
- Capacity building and training issues related to environmental health tracking.

By understanding the needs of various stakeholders, we hope to design an EPHTN that is useful to stakeholders and to increase stakeholder capacity to utilize information generated by an EPHTN to become stronger partners in achieving healthy people in healthy communities.

Stakeholder Needs Assessment Components

The overall stakeholder needs assessment consisted of five components. Below are brief descriptions for each of the components. The complete reports for the first three components are included in APPENDIX F: Stakeholder Needs Assessment Reports.

PHASE 1: SURVEY QUESTIONNAIRES

Phase 1 focused on administering questionnaires to non-governmental organizations (NGOs) and local public health agencies (LPHAs) to identify and document needs, capacity, resources, gaps, barriers, issues and priorities related to environmental health tracking. Phase 1 also helped us to identify future partners and collaborators, engage stakeholders, evaluate our communication activities, identify key messages, and generate awareness and interest.

A total of 59 surveys were returned: 29 from NGOs and 30 from LPHAs. See the Phase 1 report (APPENDIX F: Stakeholder Needs Assessment Reports) for a complete list of respondents. There was a broad range of respondents varying widely in size and jurisdiction. LPHA respondents included cities (e.g. Long Beach, population: 487,000), rural counties (e.g. Alpine, population: 1,280) and large, urban counties (e.g. Los Angeles, population: 10,103,000).[4] In addition, NGO respondents varied in organizational mission and focus as well as their geographic scope of services, ranging from small communities (Pacoima Beautiful) to international (Pesticide Action Network).

[3] Working with environmental health data includes: collecting, accessing, managing, reporting, and analyzing data.

[4] 2003 Population figures from the California Department of Finance.

APPENDIX F: Stakeholder Needs Assessment Reports includes the complete Phase 1 report.

PHASE 2: SMALL GROUP DISCUSSIONS

For Phase 2, we conducted small group discussions with representatives of NGOs and LPHAs. These discussions were designed to obtain detailed information about data and information needs and organizational/workforce capacity. Phase 2 also provided opportunities to supplement and follow up on information gathered in Phase 1.

Phase 2 was composed of seven small group discussions. We targeted four LPHAs that varied by type, geography, and size. For the NGOs, we conducted three meetings, one for each of the following regions: San Francisco Bay Area, Central Valley, and Southern California. Overall, sixty three individuals participated in seven meetings. See the Phase 2 report for a complete list of LPHAs (and programs within those agencies) and the NGOs that participated in the Phase 2 discussions.

APPENDIX F: Stakeholder Needs Assessment Reports includes the complete Phase 2 report.

TRIBAL NEEDS ASSESSMENT: KEY INFORMANT INTERVIEWS

While we sought to identify and describe issues and needs in a manner that would enable cross comparison among NGOs, LPHAs, and tribes, it was essential to identify issues, needs, aspects, and views that are unique to tribes. To that end, we identified a cross section of eight California tribes and conducted telephone and in-person key informant interviews with representatives from tribal agencies.

APPENDIX F: Stakeholder Needs Assessment Reports includes the complete Tribal Needs Assessment report.

ADVISORY GROUP DISCUSSIONS AND TARGETED STAKEHOLDER GROUP MEETINGS

The overall needs assessment was also informed by various discussions and resultant findings from our advisory groups: the Planning Consortium, the Alameda County Pilot Project Advisory Group, and the Central Valley/South Coast Pilot Project Advisory Group.

- Planning Consortium meeting and discussion summaries can be found in APPENDIX K: Planning Consortium Materials.
- Findings from the Alameda County Pilot Project Advisory Group meetings and discussions can be found on 60 and SECTION 5.l - Recipient Activity l: Information Dissemination/Communication Strategies on p165.
- Central Valley, South Coast Pilot Project Advisory Group meeting/discussion summaries can be found at: www.catracking.com/sub/p2t.htm.

We also sought feedback and input from specific stakeholder groups through targeted venues. Examples include:

- An environmental health data workshop for environmental justice organizations (collaborative effort with UCBAPE). Discussion summaries can be found at: http://www.catracking.com/ucb. UCBAPE is currently developing a comprehensive report of the workshop including findings and lessons learned.
- A conference for health affected groups (see APPENDIX ee: Discussion Summaries from the Conference for Health Affected Groups and a Tracking Conference for the Central Valley).

Furthermore, the stakeholder needs assessment findings are also informed by our Capacity Building Mini-Grant process. The mini-grant RFAs, proposals, and the final reports are included in APPENDIX Q: Capacity Building Mini-Grants.

Finally, stakeholder needs, issues, and concerns related to EPHT were also assessed through public comments for the SB702 Expert Working Group proceedings and report (see APPENDIX dd: SB702 Public Comments and Community Case Studies).

SECONDARY DATA REVIEW

We reviewed selected reports by governmental agencies and non-governmental organizations to gain an overall perspective on issues related to environmental health tracking.

The literature review included reports that either: 1) described issues, needs, and priorities related to environmental health tracking, public perceptions on environmental health issues, and local and community capacity and infrastructure related to environmental health; or 2) informed broader issues of environmental and public health in the context of environmental health tracking. Through this process, we were able to glean pertinent information that would not have been attainable through primary data collection alone.

Below is a list of reports that were surveyed for the secondary data review:

1. California Conference of Local Health Officers (2005). "Platform Statement." http://www.dhs.ca.gov/cclho/PDFs/January_2005_California_Conference_of_Local_Health_Officers_Platform_Statement.pdf.
2. California Department of Health Services, Environmental Health Laboratory Branch. "The California Biomonitoring Project Needs Assessment Report." http://www.dhs.ca.gov/ehlb/BPP/default.asp.
3. California Policy Research Center (2004), "Strategies for Establishing an Environmental Health Surveillance System in California, a Report of the SB 702 Expert Working Group." http://www.catracking.com/sub/sb702.htm.
4. Center for California Health Workforce Studies at the University of California, San Francisco. "A Snapshot of California's Local Public Health Departments." http://www.futurehealth.ucsf.edu/pdf_files/snapshot.pdf.
5. Centers for Disease Control and Prevention. "Public Health's Infrastructure – A Status Report." http://www.phppo.cdc.gov/documents/phireport2_16.pdf.

6. Children's Environmental Health Network. "California Project Interim Findings." http://www.cehn.org/cehn/cafindings.html.
7. Health-Track. "National Survey of Public Perceptions of Environmental Health Risks, California Component." http://healthyamericans.org/reports/files/casurvey0717.pdf.
8. Morbidity and Mortality Weekly Report (MMWR). "Information Needs and Uses of the Public Health Workforce." February 18, 2000, Vol. 49, No. 6, 118-120. http://www.cdc.gov/mmwr/PDF/wk/mm4906.pdf.
9. National Association of County and City Health Officials. "Information Technology Capacity and Local Public Health Agencies." http://archive.naccho.org/documents/Research_Brief_4.pdf.
10. National Association of County and City Health Officials. "Local Public Health Agency Infrastructure - A Chartbook." http://www.naccho.org/general428.cfm.
11. Pew Environmental Health Commission. "America's Environmental Health Gap: Why the County Needs a National Health Tracking Network." http://www.cdc.gov/nceh/tracking/publications.htm#pew.
12. Physicians for Social Responsibility-Los Angeles and the Environmental Health Legislative Working Group (2004). "Recommendations for Improving California's Public and Environmental Health." http://www.psrla.org/documents/environmental_health_policy2004.pdf.
13. Public Health Foundation. "Environmental Health Data Needs – Workshop Results." http://web.health.gov/environment/DataNeeds/toc.htm.
14. Public Health Foundation. "Examining Data Sharing Among State Governmental Agencies." http://www.phf.org/Reports/Data1/datashar.pdf.
15. Public Health Foundation. "Measuring Health Objectives and Indicators, 1997 State and Local Capacity Survey." http://www.phf.org/Reports/Chartbook/default.htm#TOC.
16. Public Health Institute, Partnership for the Public's Health. "Building Public Health Systems to Improve Community Health in California: An Action Agenda." http://www.partnershipph.org/col4/policy/policy_agenda.html.
17. Public Health Institute, Partnership for the Public's Health (2001). "Community Health Data." http://www.partnershipph.org/col4/docs/comhealth.pdf.
18. Public Policy Institute of California (PPIC). "Special Survey on Californians and the Environment." http://www.ppic.org/main/series.asp?i=12.

Stakeholder Needs Assessment Findings

The following sections provide a summary of findings from the various stakeholder needs assessment components. The summary is an abbreviated snapshot of findings – for each major issue, we provide general themes and/or select examples. Detailed findings can be found in the documents related to each of the components.

For this summary, findings are not aggregated by stakeholder groups (e.g. LPHAs, NGOs, etc.). Documents related to each of the needs assessment components have findings aggregated by groups when appropriate.

We have attempted to conceptualize and organize comments into multiple levels of relevant but overlapping categories in order to facilitate navigation, future analysis, and interpretation as well as integration into program strategies, recommendations, and plans. To the extent possible, we have categorized feedback and comments in the context under which the discussion occurred. Due to the overarching and interrelated nature of many of the issues, specific comments are applicable to various categories; however, we've minimized duplicate comments by selecting the most appropriate category.

Finally, for this summary, we do not attempt to translate discussion results into recommendations. The summary simply captures what we heard from stakeholders rather than the implications the results have for the program. We are incorporating these results along with those of other assessment activities in the development of future program strategies, recommendations, and plans.

Environmental Hazards/Exposures and Diseases of Concern

The following stakeholder priority hazards/exposures and health areas have been derived from various needs assessment activities with stakeholders as well as input from our Planning Consortium and two Pilot Project Advisory Groups. Slightly less influential in the prioritization process were findings from secondary data sources.

We have identified five top-tier categories[5] and five second-tier categories of hazards/exposures and health effects. We did not rank the priorities within the tiers (the five categories within each tier are listed alphabetically). The priorities are grouped into major categories (e.g. respiratory diseases, air pollutants, etc). Sub-categories or specific endpoints (e.g. asthma, diesel, etc.) are listed when applicable.

WHAT ARE THE PRIORITY HEALTH EFFECTS?

Top-Tier Categories of Health Effects (listed alphabetically)

- Cancer
- Developmental disorders and disabilities
  - Autism Spectrum Disorder (ASD)

[5] The categories are based on the candidate diseases and pollutant categories and/or environmental media for tracking developed by the California Senate Bill 702 Expert Working Group. Visit http://www.catracking.com/sub/sb702.htm for the complete report, "Strategies for Establishing an Environmental Health Surveillance System in California."

  - Learning disabilities
  - Idiopathic Mental Retardation (MR)
- Neurologic diseases
  - Alzheimer's disease
  - Lead poisoning
  - Parkinson's disease
- Reproductive outcomes
  - Low birthweight
  - Miscarriages
  - Preterm birth
  - Stillbirths
- Respiratory diseases
  - Asthma

Second-Tier Categories of Health Effects (listed alphabetically)

- Heart disease and stroke
- Diabetes
- Endocrine-disruptor related diseases
- Pesticide illness
- Sudden Infant Death Syndrome (SIDS)

WHAT ARE THE PRIORITY ENVIRONMENTAL HAZARDS/EXPOSURES?

Top-Tier Categories of Hazards/Exposures (listed alphabetically)

- Air pollutants
  - Criteria Air Pollutants (CAPS)
  - Diesel
  - Particulate Matter (PM)
  - Toxic Air Pollutants (TAPS)
  - Traffic pollutants
- Heavy metals
  - Lead
- Indoor hazards
  - Indoor air pollutants
  - Lead
  - Mold
- Pesticides

- Water pollutants
  - Drinking water pollutants

Second-Tier Categories of Hazards/Exposures (listed alphabetically)

- Endocrine disruptors
- Foodborne pollutants
- Hazardous and solid wastes
- Occupational hazards/exposures
- Persistent Organic Pollutants

Priority Data and Information Needs

This section describes stakeholder needs around data, including: types of data (e.g. specific issues, environmental hazards, health outcomes, etc.); data formats (e.g. level of analysis and interpretation); and quality of data (e.g. geographic resolution and specificity). Understanding stakeholder data and information needs will assist us in ensuring that data and information generated by an EPHTN are meaningful, appropriate, relevant, and useful to stakeholders.

WHAT ARE VALUABLE (USEFUL, EXEMPLARY, AND/OR FREQUENTLY UTILIZED) SOURCES OF ENVIRONMENTAL HEALTH DATA?

Valuable health effects data sources (listed alphabetically):

- Behavioral Risk Factor Surveillance System (BRFSS).
- California Cancer Registry and Regional Cancer registries.
- California Health Interview Survey (CHIS).
- Local/Community generated sources (e.g. community health surveys).
- Office of Statewide Health Planning and Development (OSHPD) patient discharge database.
- Vital Statistics.

Valuable environmental hazards/exposures data sources (listed alphabetically):

- California Integrated Waste Management Board (CIWMB) databases.
- GeoTracker (Groundwater Resources Information Database).
- National Toxics Inventory database – US EPA.
- Other federal data sources (e.g. HUD E-Maps).
- Pesticide Use Reporting (PUR) database.
- Response and Surveillance System for Childhood Lead Exposure (RASSCLE).
- Scorecard.org – Environmental Defense.

- Toxic Release Inventory – US EPA.

WHAT MAKES DATA SOURCES VALUABLE?

- Data accessibility (e.g. ease of access, user friendliness, centralization and consolidation of various data, etc.).
- Specificity/resolution (e.g. zip code level, county level, age groups, etc.).
- Quality (e.g. thoroughness, completeness, validity, timeliness, comprehensiveness, etc.).
- Specific to issues and topics (e.g. air quality information, asthma data, etc.).

WHAT ARE THE LIMITATIONS AND GAPS IN EXISTING DATA?

- Existing data are often incomplete and are not timely. For example, the location sand numbers of air monitors are inadequate. Also, environmental monitoring data as well as health surveillance data are not updated regularly enough nor available in a timely manner.
- Much of the existing data are not available or useful at local levels (e.g. neighborhood, city, county, census tract, etc.) due to the limitations in data collection (e.g. small sample sizes) and analysis (e.g. aggregated to state and national levels).
- Some of the data (both raw and analyzed) have severe validity and reliability issues.
- Existing data are not coordinated and consolidated across issues and agencies. Data may exist in different organizations in federal, state, and local governments as well as non-governmental organizations, but the information is not connected between the groups. It should be noted that Phase 1 survey respondents, on average, used 5 different data sources and 14 respondents used at least 10 different data sources.
- In cases where data do exist, the data may not be easily accessible, the analysis and interpretation of the data may not be appropriate, relevant, or useful, and the communication and dissemination of the data may be limited.
- There is a lack of data on topics and issues relevant to environmental health (e.g. socio-economic data, community vulnerability indicators, land-use data, etc.).

WHAT ARE OTHER RELATED DATA NEEDS?

- School data (illness related school absenteeism).
- Data on cumulative exposures and impacts, combined sources, and small source emitters (e.g. dry cleaners and gas stations).
- Biomonitoring data (exposure data).
- Data on the impacts of low-level, long term exposures.
- Move and migration information.
- Data that relevant to rural communities and their issues.
- Demographic, socio-economic, and community vulnerability data.
- Data on upstream factors and other environmental determinants of health.
- Data and indicators related to urban sprawl, land-use, walkability, livability, and green-space.

- Data related to Healthy People 2010 environmental health objectives.

WHAT ARE DATA NEEDS FOR SPECIFIC USES OR OUTCOMES?

- Data that can reveal and describe trends in pollution and health – particularly trends that can be compared across jurisdictions.
- Data that can reveal or demonstrate environmental injustices and health disparities.
- Data that can help to frame the environment as a public health issue. (For example, demonstrating the relation between housing conditions and public health).
- Data that can be used to determine cumulative exposures and impacts.
- Data that can support grants (e.g. identifying problems and needs for grant proposals, helping to meet grant reporting requirements, or facilitating impact/outcome evaluations).
- Data that can drive environmental control measures to mitigate adverse health effects.
- Data that can be used for economic analyses.
- Data that can be used for forecasting future pollution levels.

WHAT ARE THE DATA NEEDS WITH RESPECT TO FORMAT AND QUALITY?

- Timely and up-to-date data.
- Wide spectrum of data at various stages of analysis and interpretation: raw (not analyzed or interpreted) data when appropriate as well as analyzed data such as GIS maps, graphs/charts, and reports/summaries.
- Data amenable to visualization such as mapping (i.e. geocoded data), small area analysis, and easy transfer (upload/download) and manipulation.
- Data with better geographic resolution/specificity including by zip code , census tract, or other small areas.
- Better data by race/ethnicity, not just by major population groups; data aggregated by socio-economic status (SES).
- Data collected and analyzed using valid and reliable methods; particularly that which meets nationally accepted standards.

WHAT WOULD INCREASE THE ACCESSIBILITY OF DATA SOURCES?

- Information about where the data sources and websites are.
- Centralized access point (portals).
- Easier navigation on websites, including simple query functions on website.
- Transportability between different file types.
- Technical assistance in accessing data.

WHAT ARE ESSENTIAL FEATURES, FUNCTIONS, AND CHARACTERISTICS OF AN ONLINE DATA ACCESS/DISSEMINATION COMPONENT (WEB-INTERFACE) FOR AN EPHTN?

- Availability of data aggregated at various levels/areas (state, region, county, city, Census tract, zip code, Assessor's Parcel Number, assembly district, city council district, Service Planning Areas. and Health Districts, etc.); ability to retrieve data by user-selected boundaries; comparison of county/city information with other counties/cities and with state and national statistics.
- Enables stakeholders to upload street addresses or geo-coordinates and get back corresponding data on hazards/exposures (e.g. traffic volumes, air pollutant levels, proximity to facilities, etc.).
- Multiple levels of data access (raw data to analyze and interpret – not just access to maps); ability to generate data reports; ability to download and print presentation outputs in various formats; quick links to static sets of commonly requested statistics/profiles that do not require querying.
- Dynamic and interactive databases; robust but easy to use query and GIS functions; ability to save and retrieve query results (datasets) and maps; and presentation of data and information in a user friendly manner.
- Built-in, basic statistical and data analysis tools.

Needs and Issues Related to Working with Environmental Health Data[6]

Stakeholders are involved in the full spectrum of working with data. Environmental health data-related functions and roles varied widely among stakeholders. The following sections focus on factors that affect stakeholders' ability to collect, report, access, and analyze data.

WHAT FACTORS AFFECT PRIMARY DATA COLLECTION?

- Resource, capacity, and infrastructure issues.
  - Funding for infrastructure, staff, and consultation.
  - Lack of capacity, expertise, skills, etc.
- Data collection processes and procedures.
  - Lack of coordination of databases. Various state agencies request data in different formats.
  - Methodological challenges in collecting environmental data. Lack of protocols for using and validating results of simpler sampling devices.
  - Community trust. Relationships with communities.

[6] Working with data includes: accessing and acquiring data, reporting data, managing and formatting data, and analyzing data.

- Organizational scope and priority.
  - Data for meeting reporting requirements is a priority. Other data are generally not prioritized for action.
  - Most data collection is mandated: statutory and regulatory mandates.

WHAT FACTORS AFFECT DATA REPORTING?

- Processes and procedures related to reporting data.
  - Maze of local, state and federal agencies and different reporting criteria and procedures as well as data standards and formats.
  - Data reporting for local agencies is mandated.
  - Reliance on submission/reporting of data from other sources. Compliance from community reporters.
- Limited resources, capacity, and infrastructure.
  - Lack of material resources (GIS technology, funding, etc.)
  - Lack of human resources (staff, skills, etc.)

WHAT FACTORS AFFECT ACCESSING SECONDARY DATA?

- Awareness and knowledge of data and data sources.
  - Not knowing all the data sources that are out there and how they could be useful.
  - Experience level and familiarity with the various data sources.
- Quality and format of data.
  - Need access to variety of readily accessible formats (Excel, tab-delimited text, etc.).
  - Easy ways to compare geographic areas.
  - Lack of data standards.
- Processes and procedures related to accessing data.
  - Coordination, consolidation and integration of health and environmental data.
  - More robust query functions: for example, hospital discharge data by zip code, age, and by ICD instead of just by hospital.
  - Make data sets available on the web in a variety of readily accessible formats.
- Resources, capacity, and infrastructure.
  - Lack of time, personnel, skills, and funding.
- Inter/intra-agency relationships.
  - Difficultly in getting certain agencies to share data.
  - Relationships between tribes and counties.

WHAT FACTORS AFFECT DATA ANALYSIS AND INTERPRETATION?

- Quality and format of data.
  - Lack of clear statements about limitations and assumptions. Out-of-date information. Data validity and reliability problems.

- Data access (acquiring data).
  - Lack of state and federal networked information. Lack of summarized information.
- Expertise, competency and technical assistance.
  - Need for experts in GIS, statistical analysis, etc.
  - Understanding the idiosyncrasies, limitations, and caveats of data sets.
- Limited resource, capacity, and infrastructure.

Uses of Environmental Health Data for Public Health Actions

Stakeholders commented on their roles related to utilizing environmental health data for public health actions. They also commented on the possible uses of data in general. This issue received the most substantial (both in quantity and range) comments from stakeholders. The breadth of responses speaks to the potential of an EPHTN for stakeholders.

HOW ARE ENVIRONMENTAL HEALTH DATA BEING UTILIZED?

Stakeholders were asked to describe the type of initiatives and activities where they utilized environmental health data. The responses fell into five broad categories.

- Programs and initiatives (e.g. childhood lead prevention).
- Assessment and research (e.g. Housing, land contamination, arsenic, and lead study).
- Outreach and education (e.g. community asthma and clean air forums).
- Policy development (e.g. adopting and implementing the Precautionary Principle).
- Advocacy (e.g. advocacy on diesel exhaust and pesticides).

WHAT WOULD BETTER/MORE ENVIRONMENTAL HEALTH DATA ENABLE/FACILITATE?

Stakeholders provided comments on (and examples of) how better or more environmental health data would enhance existing or enable new activities and initiatives. Stakeholder comments have been categorized into the 10 Essential Services of Public Health[7]. Below are categories of responses (along with selected examples) regarding what environmental health tracking data would enable for stakeholders.

- Monitor health status to identify community health problems (e.g. identifying trends).
- Diagnose and investigate health problems and health hazards in the community (e.g. track changes or improvements in air quality, especially toxics, and changes in the health status of residents).

[7] Public Health Functions Steering Committee (1994). "Public Health in America." http://www.apha.org/ppp/science/10ES.htm.

- Inform, educate, and empower people about health issues (e.g. educate public about relationship between environmental hazards and lung disease).
- Mobilize community partnerships to identify and solve health problems (e.g. make data available and accessible to CBOs, labor groups, faith based organizations, and others to use in their campaigns).
- Develop policies and plans (e.g. advocate for changes in land use policies locally).
- Enforce laws and regulations that protect health and ensure safety (e.g. enforcement of healthy homes and public facilities).
- Link people to needed personal health services and assure the provision of health care when otherwise unavailable (e.g. establish a rural health, home health and environment testing for asthma patients).
- Evaluate effectiveness, accessibility, and quality of services (e.g. give clearer direction of program effectiveness).
- Research for new insights and innovative solutions to health problems (e.g. correlate school absenteeism with air quality issues).

WHAT FACTORS AFFECT UTILITY OF ENVIRONMENTAL HEALTH DATA FOR PUBLIC HEALTH ACTIONS

- Quality of data.
  - Relevance, specificity, validity, and timeliness.
- Data availability and access.
  - Information about where to find data, the types of data contained, and how to access the data.
  - Coordination, centralization, and integration of various data, including environmental and health data.
- Resource, capacity, infrastructure.
  - Time, personnel, skills, and funding. GIS capacity. Hardware and software infrastructure.
- Understanding and interpreting data.
  - Lack of non-technical summaries and reports of the data.
  - Understanding the various uses for the data.
- Other.
  - Lack of information on the links between health and pollution.
  - Easy ways to compare geographic areas.
  - Lack of sufficient enforcement penalties in code.

Capacity Building and Training Issues Related to EPHT

The following sections focus on issues related to stakeholder capacity in working with environmental health data. For the purposes of this section, “capacity” refers to a broad array of

community and organizational factors including resources, infrastructure, ability, readiness, skills, knowledge, expertise, etc.

WHAT ARE ORGANIZATIONS' ABILITIES TO RESPOND TO ENVIRONMENTAL HEALTH DATA/INFORMATION REQUESTS?

Stakeholders receive requests from a broad range of constituents. The general public, community members, non-governmental organizations, public agencies, and the media were cited as frequently requesting information and assistance.

Frequently asked of stakeholders (requests):

- Basic information on environmental health.
- Data on environmental hazards/exposures.
- Data on health effects.

Stakeholders are most able to provide:

- Basic information on environmental health.
- Assistance in utilizing data for action.

Stakeholders are least able to provide:

- Assistance in collecting community data.
- Assistance in conducting community-based research and studies.

WHAT ARE RESOURCE NEEDS RELATED TO WORKING WITH AND UTILIZING ENVIRONMENTAL HEALTH DATA?

- Statistical software and applications (e.g. SPSS). Tools to analyze data.
- Data collection infrastructure. Electronic mechanism and infrastructure to collect data.
- Resources (literature, case studies, training opportunities, contacts) to affect policy.
- Environmental health assessment surveys and tools.
- Resources and publications on the links between health effects and environmental hazards/exposures.
- Lab resources to analyze environmental monitoring samples.
- Risk analysis and exposure assessment models.

WHAT ARE TRAINING NEEDS RELATED TO WORKING WITH AND UTILIZING ENVIRONMENTAL HEALTH DATA?

Accessing data:

- Accessing current databases and making better sense of the information.
- Training in advanced query languages and third party data mining tools.

Collecting primary environmental health data:

- Basic overview of data collection (data collection 101)—goals of data collection, what data should be collected, how data should be collected, etc.
- Conducting health assessments.
- Determining and prioritizing what data should be collected, given limited resources.
- Developing data collection standards and guidelines as well as electronic infrastructure (systems) for data collection and management.

Information technologies, GIS, and databases:

- General computer and technology skills.
- Establishing GIS standards. Generating GIS maps.
- Manipulating and converting various data formats such as Excel, comma-separated, tab-delimited, XML (extensible markup language), etc.
- Data standards implementation and database design.
- Website development.

Interpreting/analyzing environmental health data:

- Environmental health data curricula based on different skill levels.
- Interpreting scientific data.
- Introductory course on data analysis (data analysis 101).
- Evaluating the quality of data and research findings.
- Environmental epidemiology.
- Chronic disease epidemiology.
- Environmental hazards/exposure modeling.

Program planning and development:

- Applying data in program planning and development.
- Evaluating the impact of programs and interventions.
- Appling scientific data to resource targeting.

Public education, outreach, and advocacy:

- Presenting data to various specific audiences: policy makers, public health professionals, the general public, etc.
- Risk communication: simpler and better ways to discuss and communicate risk. Communication of complex environmental health issues to the public.
- Informing and addressing health disparities and environmental justice issues.

Research:

- Studies to determine correlation between environmental hazards/exposures and health effects.
- Designing and conducting environmental health surveys.
- Developing and implementing community-based participatory research projects.
- Researching population burdens (social, economic, health, etc.) related to pollution.

Other Considerations in Designing an EPHTN

Ensuring that a statewide EPHTN will be relevant and useful to stakeholders requires seeking and incorporating their input on issues. These issues extend beyond data and information that will be incorporated and produced by an EPHTN and beyond the resources and services that could be made available. The following sections focus on broader issues and considerations as well as process issues related to the development and implementation of an EPHTN.

WHAT ARE SOME QUESTIONS RELATED TO EPHT?

- Can an EPHTN be trusted with the data and information provided by tribes?
- How can organizations and agencies incorporate locally collected data into an environmental health tracking network? Will they be able to do that?
- How will tracking inform policy and interventions?
- Many chemicals are not regulated. How will these chemicals be tracked?
- How will an EPHTN be relevant and useful to rural areas?
- Are others agencies being asked to standardize data?
- Will local agencies be mandated to share data with an EPHTN?

WHAT ARE SOME CONCERNS RELATED TO EPHT?

- The concept and practice of environmental health tracking is somewhat overwhelming. There is a lot of information, many toxins, and many diseases. Linking all this information seems like a huge task. There are so many chemicals in the environment that it can be overwhelming for an agency to keep up.

- Primary mandate for many public agencies is to enforce existing laws and regulations. Existing critical roles include responses to food borne disease outbreak, waterborne diseases, and vector borne diseases.
- In the worst case, an EPHTN could require and use scarce local resources without a corresponding benefit at the local level.
- The availability of (or lack of) funding at the state and local levels may impede achievement of the stated goals of an EPHTN.
- Federal, state, and local governments lack definitions, protocols, standards, and measurements for surveillance – this is a major obstacle for an EPHTN.
- Data may be misinterpreted and used out of context. Findings could lead to a stigmatization of communities. Insurance companies and redevelopment agencies could misuse data. An EPHTN needs to think about the implications and how communities can be protected from those who could use those findings for harm.
- It can be risky to show health and environmental data together on one map – such visualizations can be misleading.
- Various stakeholders have limited resources, infrastructure, and experience using data.
- Privacy and confidentiality issues.

WHY IS EPHT IMPORTANT?

- An EPHTN would improve the transfer and accessibility of information from database to point-of-use.
- Data on risk and exposure, which is at this time difficult to track and retrieve in a timely and user-friendly manner, would support environmental health policy decisions.
- Integration of existing and new databases could be valuable.
- An EPHTN would provide opportunities for local communities to utilize larger data sources.
- Data can be a powerful tool for raising awareness and advancing issues.
- Tracking would be a good step towards getting local agencies to focus on broader environmental health concerns. Local agencies have traditionally focused on regulatory and enforcement aspects of environmental health. In addition, the main focus has been around infectious diseases.

WHAT WILL FACILITATE THE SUCCESS OF EPHT?

- Broaden and expand the definition of environment and environmental health. It is important to keep in mind that the definition of environment varies by communities and cultures.
- Actively ensure that EPHTN findings and results inform and drive policy and interventions.
- Because of the limitations of and gaps in public (governmental) data, an EPHTN needs to integrate private data (e.g. from hospitals, clinics, HMOs, etc.).
- An EPHTN must incorporate environmental justice principles into all phases of the program (i.e. both planning and implementation).

- An EPHTN needs to evaluate and integrate other relevant data (e.g. housing, violence, economic indicators, social indicators, healthcare, and transportation).
- Develop and evaluate methods for examining multiple exposures, long-term exposures, cumulative impacts, and synergistic effects. An EPHTN must examine driving forces related to environmental hazards and exposures.
- An EPHTN will only be as good as the data that are generated by individual data systems. An EPHTN must assist data system owners in enhancing their systems so that they are better prepared for integration into an EPHTN. An EPHTN must provide resources and encourage system owners to collect high quality data (e.g. valid address data).
- Involve and collaborate with a wide range of stakeholders in the development and implementation of an EPHTN.

WHO SHOULD BE KEY PARTNERS AND COLLABORATORS IN EPHT?

- Ensure that tribes are involved in EPHTN issues and activities. Provide funding to the tribes. Facilitate open dialogues with tribes and incorporate their needs.
- EPHTN must collaborate with other intra and inter-agency programs. There is a general lack of intra-agency coordination and cooperation within state agencies; an EPHTN can be a good foundation for such cooperation.
- Communities often know what agencies and organizations do not. A key component in the design and implementation of an EPHTN should be to elicit and incorporate community insight. EPHTN must ensure community participation and involvement; advisory groups must have broad community representation.
- An EPHTN will have many limitations due to its scope and due to the fact that it is a governmental program. An EPHTN must collaborate with non-governmental organizations that can often take actions and affect policies in ways that agencies cannot.
- There is a general mistrust of government, especially in rural areas. Communities often don't believe findings produced by the government. An EPHTN must ensure that academic partners are getting and using the information because the public may consider their information more trustworthy and objective.

WHAT ARE OTHER OBSERVATIONS AND RECOMMENDATIONS REGARDING EPHT?

- Tracking is still in its infancy; however, there are still some good data and information out there. There needs to be an effort made to improve the dissemination of existing data.
- Data should be used to reduce exposures – not just emissions. Simply reducing emissions is insufficient because of the persistence of chemicals.
- Communities need both quantitative and qualitative data to tell an effective story. An EPHTN needs to consider how to incorporate community knowledge.
- An EPHTN will have limitations in what it can do because it is essentially a surveillance program and not an intervention or service program. An EPHTN lacks the authority to impact enforcement and regulation. Therefore, an EPHTN must examine how to best facilitate the use

of data in the delivery of public health services and bridge the gap between information and public health practice.

- Many stakeholders are interested participating in the development of an EPHTN, but it is hard to prioritize spending time on EPHTN when there are other, more immediate issues to deal with (e.g. flu).
- With the exception of groups that focus primarily on specific diseases or chemical/physical agents, most stakeholders (including tribes, local public health agencies, and community-based organizations) take a broader approach to understanding and addressing environmental health issues.
- Identify and collaborate with other partners and stakeholder who can utilize EPHT information for public health functions (especially functions that may be limited for governmental agencies such as advocacy and policy).

Alameda County Pilot Project Advisory Group Assessment

The Alameda County Pilot Project Stakeholder Advisory Group (AG) consists of representatives of over 25 organizations, including: community-based and non-governmental organizations; local, regional, and state government agencies; and health service providers. The comments below summarize input from a number of in-depth discussions and reflect the general sentiments of the AG as a whole. This input was gathered over the course of five AG meetings from January 2004 through June 2005. Discussion of the process for soliciting input from the AG can be found in SECTION 5.i - Recipient Activity i: Demonstration Project on p115.

Over the course of the AG process, the group described general issues and needs for environmental health information.

Relevant and useful information:

The AG indicated that information should address community needs and interests. This includes:

- Local and community level data.
- Data for wide geographic areas available at multiple geographic scales.
- Data comparable across communities and to state and national figures.
- Information that can identify disparities by geography, race/ethnicity, and socioeconomic status.
- Information in a social, economic, and/or environmental context of health problems
- Regularly updated information, particularly on information that directly affects the community.
- Cost benefit analyses regarding hazards, illnesses, and interventions.
- Spatial/temporal analysis and the locations of hotspots.

The AG also felt that data collection, information dissemination, and applications of new findings in affected communities should be institutionalized.

Accessible information:

AG members emphasized the need for information to be widely accessible, particularly to affected individuals and residents of affected communities. Representatives of government agencies also echoed their own need for improved access to information. Access would be facilitated by:

- Technical assistance and capacity-building to locate and access information.
- Dissemination of results directly to community residents.
- Dissemination via the Internet (but need to address digital divide issues simultaneously).
- Dissemination of information in a variety of formats, including downloadable tables, reports, and other "pre-made" materials.

Comprehensible information:

For the information to be easily understood once in-hand, AG members indicated a need for:

- Information in both technical and lay terms.
- Information in multiple languages
- Inclusion of interpretive narrative for all numbers, figures, etc.
- Referrals to additional resources or background information.

Technical assistance for using and collecting environmental health data:

The AG indicated that it was important for a EPHT program to provide technical assistance and build capacity to:

- Collect, interpret, and use environmental health data.
- Strategize on how to use data for advocacy.

A complete summary of AG input and detailed AG meeting summaries can be found in APPENDIX G: Alameda County Pilot Project – Summary and Complete Meeting Notes. Specific issues around asthma and air quality information, as well as responses to pilot project results, are described in SECTION 5.i - Recipient Activity i: Demonstration Project on p115. AG input on information dissemination and capacity-building issues is described in SECTION 5.l - Recipient Activity l: Information Dissemination/Communication Strategies on p165.

5.b.2. Challenges and Barriers

- The original proposal by the CEHTP to CDC stated that data inventory activities would be undertaken in the context of existing surveillance systems' ability to integrate within an EPHTN. A barrier to moving forward with this assessment was deciding on how qualitatively extensive the survey should be and what levels of government should be included. The first recommendations by the Technical Team (TT) assisted us in limiting the scope to existing surveillance systems and using an iterative approach to understanding each system. By avoiding a single barrage of questions that may not all be applicable to all identified surveillance systems, we were able to solicit general responses in the first phase that were further developed in the second phase of the Future Assessment.

5.b.3. Lessons Learned

- The convening of a Technical Team that comprised information systems specialists from universities, laboratories, and multiple environmental and health agencies assisted us in guiding the efforts of the technical needs assessment of surveillance system owners. Additional information about the Technical Team is provided in SECTION 5.d - Recipient Activity d: Planning Consortium on p77.
- By assembling a Technical Team, we achieved an unexpectedly high level of outreach. Many potential stakeholders became aware of the discussions and issues that were occurring at these meetings. Aside from the logistical complexity, this interest was effectively utilized since some of these stakeholders became sitting members on the TT and others provided offline commentary. In both instances, the TT activities provided substantial insight into how the EPHTN should function. Another unintended consequence of the TT activities was the translation and scaling of key requirements identified for the EPHTN to department-wide requirements. One example of this could be seen in the California Department of Health's ongoing effort to provide centralized geocoding services to all interested programs within the department. The requirements for the centralized geocoding system were largely gleaned from the TT discussions.
- The EPHTN needs assessment of central surveillance systems addressed organizational, information technology, and other data quality/scope requirements that are necessary for developing an EPHTN architectural framework. The first step in this assessment involved reaching out to existing environmental and health surveillance systems and characterizing their technological and organizational capacity for future integration into a tracking framework. The Future Assessment successfully performed this task by completing all of the prescribed activities and documenting the results in two phases of briefing reports. These products also served to identify collaborative opportunities that work towards establishing and/or enhancing data system exchange infrastructure.
- One of the lessons learned from surveillance system needs assessment activities was that a significant barrier was the lack of established standards-based data sharing programs at environmental and health departments. Many systems are in the concept phase or were unaware of federal and state initiatives (NEIEN, PHIN, CA IDEA, and CalPHIN) to encourage and fund cross-platform data sharing technologies. Many systems have not

identified funding sources for completing proof-of-concept programs or implementation projects. The Future Assessment activities introduced each of the surveillance systems to this CEHTP requirement and provided a basis for future communication and collaboration in encouraging surveillance system owners to move toward this goal.

- The Future Assessment also identified challenges to the development and implementation of the EPHTN. The challenges consist of external adversity (which are outside our program's direct control) and internal weaknesses that may be controlled through our administrative or operational activities. Listed below are some of the hindering factors that EPHT program must take into account when partnering with surveillance system owners:
  - Current funding mechanisms and budget constraints create a difficult environment in which to develop and maintain information systems.
  - Requirements to protect privacy and confidentiality of data continue to increase.
  - Organizations often cannot keep pace with technological advances.
  - Organizations often lack adequate information technology capacity and resources.
  - Many standards for data confidentiality, privacy, and security are unclear or inconsistent.
- Our needs assessment activities elucidated the idea that our program is situated in a position to bridge the informational and functionality needs of both surveillance system owners and stakeholders to environmental health tracking information.
- With the passage of SB189, which resulted in the execution of a Memorandum of Understanding between California Department of Health Services and California Environmental Protection Agency, a formal framework exists to support collaboration among health surveillance and environmental monitoring system owners.
- The needs assessment activities also proved to be a very effective form of outreach and education.
- Having a workgroup (Needs Assessment and Outreach Workgroup) made up of diverse stakeholders to assist in both the development and implementation of a stakeholder needs assessment strategy was invaluable.
- As a method for garnering input about tracking needs at the local level, the pilot project stakeholder advisory group process was effective in part because participants were able to engage with concrete, relevant examples of tracking, which enabled thoughtful and relevant feedback.

5.b.4. Recommendations

- Activities that aim to implement new data sharing functionality and to enhance the completeness and spatiotemporal specificity of data content should be addressed on a system-by-system basis and should have short- and long-term goals. Each enhancement project should identify the specific areas of mutual benefit, with EPHT programs providing expert evidence that might assist a data system owner in building the case for a new mandate. Short-term goals will tend to emphasize ad hoc data exchange in which we demonstrate the immediate value of an enhancement. Hosting of new technology in the short-term will likely rest within our domain, however, we should simultaneously develop portable foundational business rules that

can be efficiently migrated to the system owner domain at a later date. Long-term goals of each partnership will emphasize more federated and systematic data flows, with the implementation of more detailed business rules that take into account the system owners' unique computing environment. In the long-term, system owners will have the highest degree of operational control over their data content and functionality holdings.

- The process of identifying and incorporating stakeholder needs, perspectives, and priorities in the design and implementation of an EPHTN should be an iterative process. It should involve continuously hearing and learning from stakeholders, integrating their feedback, demonstrating and communicating the outcomes, effects, or products, and repeating those steps. As our program continues to develop, gain more knowledge, and generate data/information, the need will arise to gather further input. Furthermore, as stakeholders become increasingly more aware of and familiar with an EPHTN, the need arises to gather new, relevant, and/or more targeted input and feedback.
- EPHT program should continue to conduct needs assessment activities by identifying gaps and opportunities (by issue, audience, and/or geographic area) for key stakeholder input. For example, in 2006, our program will collaborate with the National Association of County and City Officials to organize a facilitated group discussion with LPHAs. Knowledge gained and lessons learned from our other relevant activities and processes (e.g. program evaluation, Capacity-Building Mini-Grants, etc.) should continue to inform the overall needs assessment findings.
- Entities that have authorities to take actions to address environmental health problems should be identified, and their information needs and interests assessed. These needs and issues should be specifically addressed in the design and implementation of an EPHTN.