

**Maternal and Child Health Epidemiology
in State Health Agencies:
Guidelines for Enhanced Functioning**

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Forward

The changes in the provision of health services in Maternal and Child Health throughout time has been profoundly impacted by the introduction of political, programmatic, and scientific developments. One of the greatest changes has been the introduction of the conceptual framework supporting evidence-based decision-making processes in policy-making, program development, and information supporting activities. For example, one of the landmarks supporting this argument was the introduction of the Government Performance Results Act in 1993 supporting strategic planning and performance measurement in the US government (otherwise known as GPRA Act) that has set the stage in MCH for the current performance measures and health indicators that drive the evaluation of the MCH Title V Block Grant.

In today's settings, valid, reliable, clear, and timely information has become the foundation of the knowledge that drives our programs and policies. In fact, as it has been stated in many fields "knowledge is power". Translating this sentiment into the field of public health means that enhanced knowledge should lead to effective prevention and timely interventions, assuring the best possible health status to our maternal and child health population.

Knowledge, information, and /or evidence generation are key components of health systems in the practice of modern public health. Because several billions of dollars are invested in the MCH population every year and policies provide the settings where MCH programs are orchestrated in an attempt to prevent disease and assure health, it is important that an evidence-based decision process support these efforts. However, it is not clear if the resources available in MCH epidemiology support the ability to generate the knowledge needed to drive these policies and programs that we have so eagerly promoted for the past two and a half decades in the US.

According to information from three surveys conducted by the Council for State and Territorial Epidemiologists (CSTE) to evaluate US epidemiology capacity at the state level in 2001, 2004, and 2006, MCH epidemiology capacity has grown across the states in the U.S. Nevertheless, there is very little detailed information available about what has worked to build this capacity, what the characteristics of this capacity are, information about the use of information in all states, and more importantly, what makes the difference between successful models of MCH epidemiology capacity as opposed to non-successful ones. All this information could be used to move the field of MCH epidemiology forward in an informed process, so trial and error or just intuition need not to be used by the states to implement a successful model for MCH epidemiology.

The Centers for Disease Control and Prevention Maternal and Child Epidemiology Program in partnership with the Human Resources and Services Administration, Maternal and Child Health Bureau supported a detailed evaluation of MCH epidemiology capacity through an agreement with the University of Illinois at Chicago. This project was aimed at improving the ability of state public health agencies to carry out effective maternal and child health (MCH) epidemiology through the use of the knowledge generated by it. Providing useful and useable information that relates to the effectiveness of the systems in MCH epidemiology was the foundation. The evaluation was planned so three main objectives would be achieved:

1. To summarize current patterns of MCH epidemiologic capacity and functioning within state health agencies,
2. To assess the relative ability of various constellations of structure and process factors to promote effective MCH epidemiology practice, and
3. To delineate models of effective MCH epidemiology.

This report summarizes the main findings of this important project and provides recommendations for states to improve their capacity in MCH epidemiology regardless of the current status. The sound methodology used by the investigators guarantees valid and reliable information that has not been

available until now. This information will allow program directors and policy-makers to effectively improve the systems in their states covering the maternal and child population.

Our most important commitment is to assure health and prevent disease of women and children and their families. We must do so while being effective in the use of our resources. Information provided by effective and improved MCH epidemiology systems should drive effective programs and policies. We hope this project will help state and other public health agencies throughout the nation with the appropriate tools and information to help them in this endeavor.

Juan Acuña and Michael Kogan
May, 2008

Executive Summary

These guidelines are the culmination of a project carried out by a team from the University of Illinois at Chicago School of Public Health (UIC) in order to identify sets of characteristics that are associated with enhanced maternal and child health (MCH) epidemiology functioning in state health agencies. The report goes beyond describing the current status of MCH epidemiology in the states to asserting particular factors that can distinguish higher from lower levels of functioning. The concept of the "MCH Epidemiology Effort" is used throughout this document to underscore the focus on MCH epidemiology functioning at the organizational level rather than on the skills and expertise of individual MCH epidemiologists.

The project collected new data from all 50 states and the District of Columbia via telephone interviews. Each state and D.C. was also asked to submit a packet of material that demonstrated the breadth, depth, and capacity of its MCH Epidemiology Effort. In addition, several organizations, including CSTE, HRSA/MCHB, and the CDC also provided the project with a wealth of secondary data. Using the data from the interview and state packets, the UIC team created a measure that summarized a state's level of MCH epidemiology functioning. The measure, with three categories labeled "below average", "average", and "above average" served as the outcome variable for the analysis presented here.

Ten questions framed the analysis:

1. How important is it to have a distinct MCH Epidemiology unit within the state agency?
2. Does having a single, identified leader strengthen the MCH Epidemiology Effort?
3. Is there an approach to setting the agenda for the MCH Epidemiology Effort that typifies higher level functioning?
4. What level of staff education and continued training best supports higher level MCH epidemiology functioning?
5. Do CDC assignees, other assignees, fellows, and interns strengthen the MCH Epidemiology Effort?
6. Is having a data environment that promotes data sharing for both internal and external users as well as data integration (linkage) related to MCH epidemiology functioning?
7. Does increasing use of sophisticated epidemiologic methods characterize an MCH Epidemiology Effort that is functioning at a higher level?
8. Are particular approaches for disseminating the work of the MCH Epidemiology Effort associated with enhanced functioning?
9. Do interpretation and translation of data reflect an MCH Epidemiology Effort functioning at a higher level?
10. Is there a relationship between population size and resources, and the level of MCH epidemiology functioning?

The project findings strongly support many recommendations of previous assessments of the field of MCH Epidemiology (Handler, Geller, Kennelly, 1999; CSTE, 2002; CSTE, 2004), including the need to identify best practices for the field, the importance of advanced training for MCH epidemiology staff, the need for MCH staff to have ready access to a variety of databases including those that are linked, and the necessity of a visible MCH epidemiology presence. This project adds specificity to these and other issues by quantifying associations between sets of factors and the level of MCH epidemiology functioning and also by highlighting factors of particular importance for states in the early stages of developing MCH epidemiology capacity and those factors more germane for states moving toward state-of-the-art practice. An important new finding relevant for all states was the strong association between higher level functioning and setting the MCH epidemiology agenda through collaboration of staff from multiple programs / units within state government along with stakeholders from outside the state agency.

The following are recommendations for action at the state and federal level (these appear in greater detail in Table 48):

State health agencies and their associated Title V programs should	Federal agencies that support the field of MCH epidemiology should
<p>S1. Establish a named unit for the MCH Epidemiology Effort, or at a minimum, ensure a specified, visible focus within the state agency.</p> <p>S2. Ensure that the MCH Epidemiology Effort has leadership with organizational recognition and authority.</p> <p>S3. Acknowledge the broad scope of MCH epidemiology by breaking down administrative barriers to shared leadership and promoting a broad, collaborative approach to setting the MCH epidemiology agenda.</p> <p>S4. Invest in hiring increasing numbers of individuals with doctoral degrees.</p> <p>S5. Invest in building an MCH epidemiology staff that is comprised of a critical mass of individuals considered to be epidemiologists.</p> <p>S6. Actively pursue opportunities to obtain external support and resources for the MCH Epidemiology Effort, such as CDC/HRSA assignees, CSTE fellows, university interns, etc.</p> <p>S7. Provide MCH Epidemiology staff with time and funding to access epidemiology training.</p> <p>S8. Ensure that MCH epidemiology staff and also external partners have direct access to a wide variety of datasets relevant to MCH.</p> <p>S9. Establish protocols for routine data integration (linkage) beyond birth-death data</p> <p>S10. Disseminate the work of the MCH Epidemiology Effort using multiple approaches and venues.</p> <p>S11. Establish mechanisms for MCH Epidemiology Effort and other program and policy staff to jointly translate findings into information for executive and/or legislative action.</p> <p>S12. Encourage and support the ability of external partners to turn data into information.</p>	<p>F1. Provide funds for training and technical assistance focusing on strengthening the organizational position of MCH epidemiology, on developing collaborative leadership, and on effectively working with internal and external partners</p> <p>F2. Continue and expand financial support for graduate training in MCH epidemiology; require individuals receiving federal targeted funds to conduct master's internships or doctoral dissertations in collaboration with state (or local) health agencies.</p> <p>F3. Develop an articulated pipeline for graduating MCH Epidemiology students to obtain appropriate positions in state (or local) health agencies.</p> <p>F4. Continue and expand financial support for the placement of a variety of skilled individuals in state health agencies, paid for solely or in part by the federal government (e.g., CDC/HRSA assignee) or through partnerships with organizations such as CSTE.</p> <p>F5. Expand the use of the Title V Block Grant Annual Report, Application, and Needs Assessment as a mechanism for promoting reporting that requires use of multiple, integrated data systems to carry out sophisticated analysis.</p> <p>F6. Provide funds for the infrastructure development necessary to fulfill all Block Grant mandates.</p> <p>F7. Provide support for training of MCH Epidemiology Effort staff and their internal and external partners on effective ways to disseminate and translate findings into information for action.</p> <p>F8. Expand the use of the Title V Block Grant Annual Report, Application, and Needs Assessment as a mechanism for promoting policy-relevant interpretation and recommendations for action.</p>

After two decades of capacity-building initiatives following the passage of OBRA 1989, a renewed effort to advance data-based decision-making in maternal and child health is necessary. In addition to the expansion of reporting requirements and provision of workforce training which remain essential activities, the federal government should use its funding authority to provide financial rewards to states that use the tools of epidemiology to plan, implement, monitor, and evaluate programs and policies. This linkage of funding to data-based decision-making would not penalize those states that are still working to build their capacity, as any state able to document that it is taking concrete steps toward best practices would be rewarded for doing so. Moreover, all states, even those already functioning at a higher level cannot be expected to fully engage in evidence-based decision-making unless there is corresponding federal and state support for the data infrastructure and databases, including vital records, that are the lifeblood of the MCH Epidemiology Effort.

The growth in the field of MCH epidemiology stems from the belief that evidence-based decision-making is necessary for improving the health of women, children and families. The recommendations and perspective provided in this report are a reflection of that belief.

Background

Maternal and child health (MCH) epidemiology has emerged as a distinct field over the past twenty years as state and local health agencies in general have been transitioning from the delivery of personal health services to carrying out the core functions of public health. Making this shift has required these agencies and their respective MCH efforts to redefine their missions, to hire individuals with different types of skills and abilities, to retrain and/or provide additional training to current staff, and to commit themselves to data-based decision-making in all aspects of the planning cycle, from program planning and evaluation to policy development and advocacy. In order to assist states in this process, the federal government [Maternal and Child Health Bureau/Health Resources and Services Administration (MCHB/HRSA) and Division of Reproductive Health/Centers for Disease Control and Prevention (DRH/CDC)] and its partners have implemented a variety of initiatives to enhance the analytic capacity of state and local health agencies.

Pivotal among these analytic capacity building initiatives was the creation of the CDC/HRSA MCH Epidemiology Program (MCHEP), which has been assigning MCH epidemiologists to public health agencies since 1986 (Rochat et al., 1999). These individuals serve as senior scientists to provide state MCH agencies with the analytic leadership necessary to engage in data-based decision-making (Rochat et al., 1999; Handler et al., 1999). Other initiatives sponsored by the federal government have included the delivery of both face-to-face and distance-based trainings, publication of analytic methods workbooks, briefs, and modules, the provision of skills building workshops at conferences, the support of pre-doctoral and doctoral training as well as student internships, and the establishment of the CDC/Council of State and Territorial Epidemiologists (CSTE) MCH Epidemiology Fellows Program. In parallel to these capacity building activities aimed at improving the skills of the MCH workforce, the Title V Block Grant has provided supplemental funding to states through the State Systems Development Initiative (SSDI) to facilitate improvement in components of the data infrastructure.

MCH Epidemiology in the states evolved and matured as states took advantage of these capacity-building opportunities. By the end of the 1990s, it became important to document the state of the field and gain an understanding of how to continue moving forward. Consequently, a number of efforts were designed to assess the capacity of the state MCH epidemiology enterprise to turn data into information, and to identify the factors that facilitate that capacity as well the factors that create barriers to increasing it. Major efforts aimed at assessing and measuring analytic capacity in state health agencies include:

- University of Illinois at Chicago (UIC): Case-Study Evaluation CDC/HRSA Maternal and Child Health Epidemiology Program (MCHEP), Benchmarks of Effective State MCH Epidemiology (1998)
- Association of Maternal and Child Health Programs (AMCHP): Guidelines for State MCH Data Capacity (2001)
- Johns Hopkins School of Public Health, Capacity Assessment for State Title V (CAST-5) Instrument (2004)
- CDC: Assessment and Monitoring Tool for MCH Epidemiology and Data Capacity (2003-2004)
- CSTE: National Assessment of Epidemiologic Capacity in Maternal and Child Health (2002 and 2004)

The data collection instruments developed for use in each of these assessments were in fact as important as the findings they generated, as their content reflected the prevailing conceptualization of the expectations for effective MCH epidemiology. For example, the UIC Case Study Evaluation proposed benchmarks of effective MCH Epidemiology within four domains: vision and planning, infrastructure,

analysis and utilization, and translation and dissemination. (Handler et al., 1999) The AMCHP Data Committee’s guidelines for state MCH data capacity (2001) focused on access and utilization of data sets, access to and application of select personnel skills, production of key reports, and identified areas for data utilization; CAST-V focused on systems context, organizational environment, organizational capacity and effects (performance and outcome measures); the CSTE capacity assessments used the Ten Essential Public Health Services Framework.

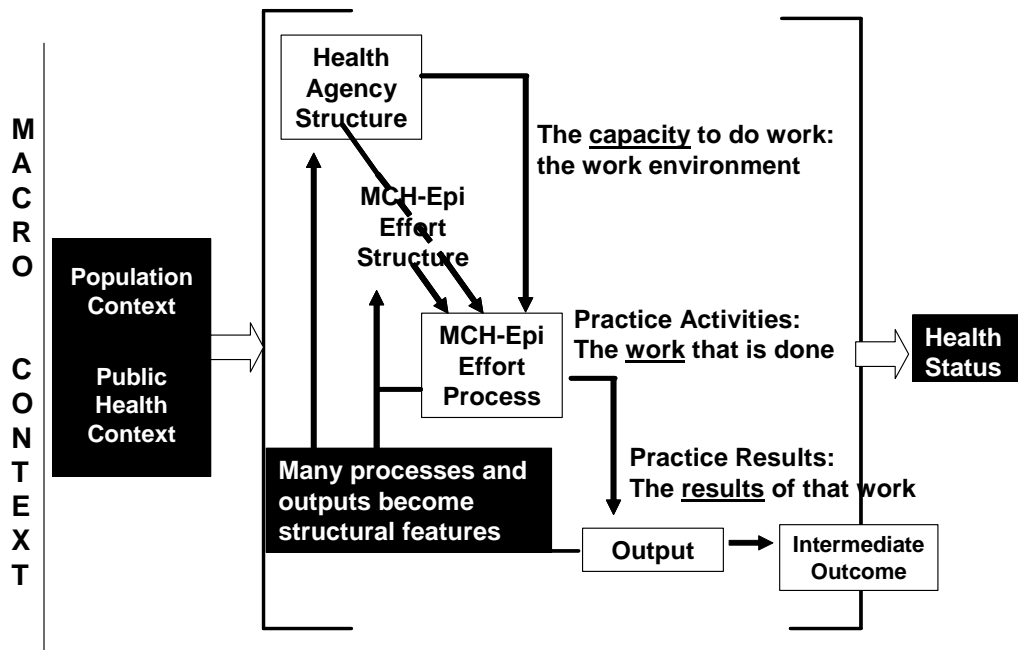
In all of the previous efforts there was a clear understanding of the multi-dimensional nature of MCH Epidemiology/analytic capacity, but the focus was on providing a description of what existed in state agencies rather than explicitly connecting particular factors to the level of MCH epidemiology functioning. In 2004, the UIC School of Public Health received funding to build upon the previous work by analyzing current patterns of MCH epidemiology practice in state health agencies in order to identify pathways to improved functioning. This analysis would entail consideration of many factors that singly or in combination explain differences in the levels of functioning observed in the states and the findings would then point to concrete action that states could take to move toward enhanced functioning.

Overview of the Project

In order to examine the functioning of MCH epidemiology in the states, the UIC project team began with the framework used by Handler and Turnock et al.2001 (based on Donabedian, 1980) to examine public health performance. This framework deconstructs a public health effort into its base components: structure, process, outputs and outcomes. In this model, structure includes information resources, organizational resources, human resources and fiscal resources (Turnock, 1997). Processes include those used by practitioners to identify, address and prioritize community or population health problems. These in turn lead to outputs including specific interventions, policies, regulations, programs and services. Outcomes are the immediate and long-term changes in health status experienced by individuals, families, communities and populations and are the cumulative result of the interaction of the structural capacity and processes, given the larger socio-political-economic environment.

Figure 1 shows the structure-process-output-outcome framework slightly modified by the project team to more particularly reflect the shape of MCH epidemiology in state health agencies.

Figure 1. Modified Conceptual Model

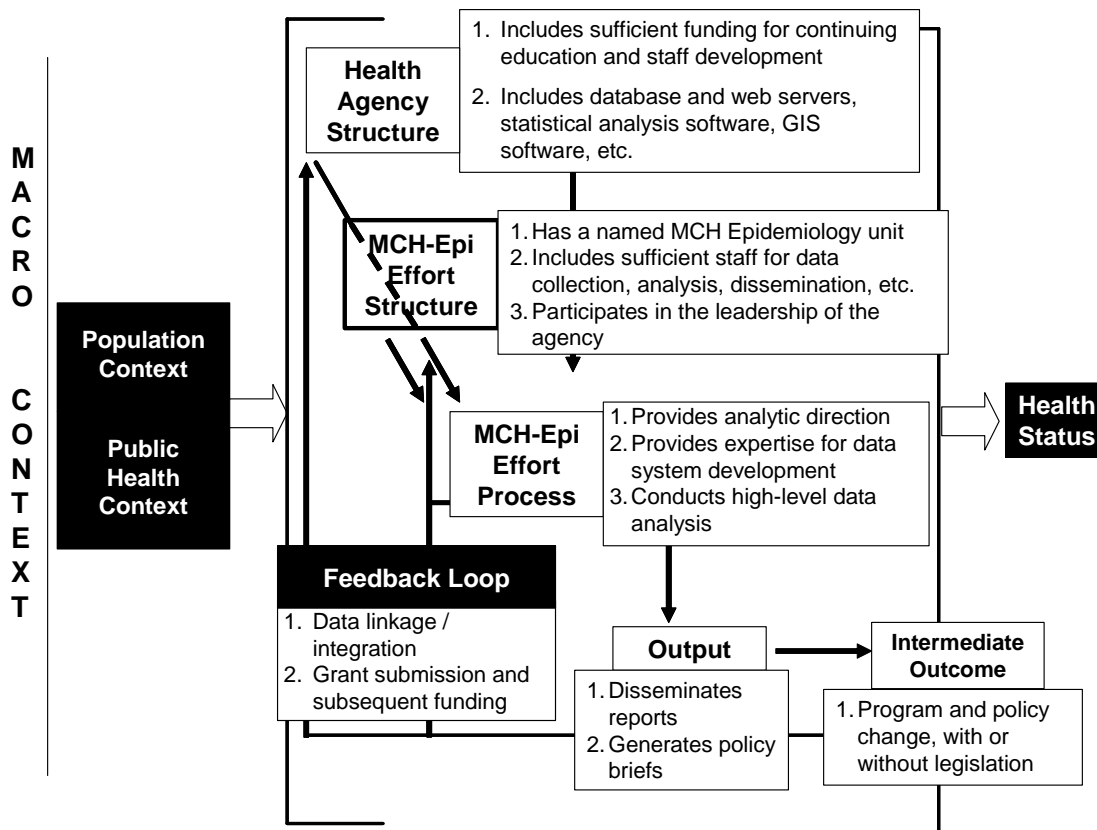


Notice that in Figure 1 structure has been divided into two components: 1) the health agency structure, and 2) the MCH Epidemiology Effort structure. The concept of the "MCH Epidemiology Effort" was developed by the UIC team in order to underscore the project's focus on MCH epidemiology functioning rather than on the skills and expertise of individual MCH epidemiologists. The MCH Epidemiology Effort, then, is defined as the epidemiologic work of multiple units and agencies that is aimed at informing program planning and policy development on behalf of women, children and families. In this definition, the Title V Program of course plays a critical role, often anchoring the MCH Epidemiology Effort, but other areas such as childhood lead poisoning, family planning, and women's health – areas typically not identified as maternal and child health epidemiology per se – are included as well.

In addition, Figure 1 also incorporates the proposition that the components of the framework are not merely sequential—that is, process does not merely follow structure; outputs do not merely follow process; and outcomes do not merely follow outputs. Instead, there is what might be called a “feedback loop”, such that certain processes and outputs, once they become routine and institutionalized, emerge as structural features. Thus, the modified framework can accommodate the complex directionality and dynamism of MCH epidemiology functioning.

The UIC project team and its Advisory Group developed a detailed list of structure, process and output indicators, and organized these into a set of domains and subdomains. The set drew heavily on the previous assessments described above, but here, the indicators were stated in such a way as to define a set of "best practices". (See Appendix A.) Figure 2 shows the conceptual model again, this time providing some examples of the types of indicators corresponding to each component of the framework.

Figure 2. Modified Conceptual Model with Example Indicators



Attaching indicators to the components of the conceptual model underscored the importance of understanding the components of the model as dialectical rather than sequential. This perspective raised questions of the following type:

- Does institutional vision and capacity promote a high level of MCH epidemiology leadership, or does MCH epidemiology leadership promote a high level of institutional functioning, or both?
- Does a state-of-the-art technical environment promote more sophisticated analysis, or does recognition of the need for more sophisticated analysis promote development of the required technical capacity, or both?
- Does the quantity and quality of the workload determine staffing levels or do staffing levels determine the quantity and quality of the work, or both?

It became clear to the UIC project team that precisely identifying developmental steps that should occur in some pre-defined order would not be possible or useful. States move toward a high level of functioning in a multitude of ways, starting with widely varying organizational circumstances that give rise to widely varying pacing and sequencing of changes that in turn lead to higher levels of functioning. The goal of analysis, therefore, would not be to identify structure-process-output pathways, but rather to identify sets of characteristics across all of the domains that can be shown to be associated with enhanced functioning.

The project team proposed to use existing data where possible and supplement this by collecting new data to fill in identified gaps. Several organizations contributed to building a secondary dataset for analysis. The UIC project accessed the following data:

- CSTE Capacity Assessment (2002 and 2004) <http://www.cste.org/>
- Title V Information System (TVIS) Capacity Indicators (1996-2005)
- Florida State University, College of Medicine Center for Medicine and Public Health (FSUCOM), State Public Health Survey datasets (2001)
- CDC/HRSA MCH Epidemiology Conference Registration Data (2004-2005)
- CDC Assignee History (compiled by Roger Roachat with assistance from Bill Sappenfield and Hani Atrash) (1996-2005)
- MCH Epidemiology Training (AMCHP and CRP) (2002-2005)
- U.S. Census (2000)

While the integration of these secondary data sources provided a rich set of data elements, the extent of missing data was problematic. Since states and the District of Columbia were the units of analysis, sample size was, by definition, constrained to be a maximum of 51; therefore, any missing data would compromise the analysis, particularly multivariable analysis. Given this, the project decided it was important to collect new data from all 50 states and the District of Columbia, sometimes revisiting data elements that were present in the other existing data and sometimes generating new data elements.

Telephone Interviews with the states were conducted between March and July, 2006. (The word "states" will be used to refer to all 51 jurisdictions in the remainder of this document.) The initial contact with each state was made via the MCH Data Contact (identified by AMCHP), and then a date for the interview was arranged to accommodate a group of state staff (as determined by each state) as well as two members of the UIC team. Typically, there were 3-5 staff participating on the telephone call, at a minimum, including an identified MCH data spokesperson along with the Title V Director or designee. The interview lasted approximately 1-1.5 hours, and, with permission, was electronically recorded as well as hand recorded by both UIC project team members. At the end of each interview, the two team members wrote separate, brief summaries of the interview.

The interview questions (Appendix B) were developed to reflect the project's focus on organizational (i.e., the MCH Epidemiology Effort) as opposed to individual competencies. The initial questions on the data collection instrument acquainted the state respondents with the UIC project's definition of an MCH Epidemiology Effort—"the totality of epidemiologic work carried out for MCH in your state"—and asked them to describe the Effort in their state. As part of this description, each state was asked to identify three programs / units / departments *in addition to the Title V program* that they consider to be the core members of their MCH Epidemiology Effort. Table 1 shows the array of partners reported by the states.

Table 1. Core Members of the MCH Epidemiology Effort

Program / Unit Reported	# of States		
Asthma Program	1	States reported a variety of partners, ranging from individual programs and grant-driven activities, to large departments and divisions of the state's infrastructure, to university collaborative relationships.	
Children With Special Health Care Needs	1		
Chronic Disease	1		
Education Department	1		
Environmental Health Section	1		
Hospital Data	1		
Human Services	1		
Infant Mortality	1		
Information Technology	1		
Nutrition	1		
Perinatal	1		
Prevention Services	1		
SSDI	1		
Communicable Disease Section	2	The leading members of the MCH Epidemiology Effort—those reported by at least 20% of states—include:	
Community Health Section	2		
Immunization	2		
Mortality Review	2		
Newborn Screening	2		
Oral Health Section	2		
Family Planning Section	3	Birth defects surveillance programs were identified as core participants in the Effort by 14% of the states.	
Health Policy Section	3		
Laboratory	3		
Lead	3		
University	3		
Women's Health Section	3		
Child/Youth Health Section	4		Most of the states (76%, n=39) included at least one "data partner" among the three key members of their MCH Epidemiology Effort and therefore this indicator could not explain differences in the level of MCH epidemiology functioning. This does not mean that considering data-related units as core members of the MCH Epidemiology Effort is unimportant, but rather that most states have already reached this stage of development. In fact, several of the states at the highest level of functioning did not explicitly name a data partner because it was viewed as a given—to these states, broadly partnering with programmatic areas traditionally seen as separate from MCH activities was reported as the more advanced activity.
PRAMS	4		
Injury Prevention	5		
Surveys (BRFSS, YRBS)	5		
WIC	6		
Birth Defects	7		
Medicaid	11		
Epidemiology Section	13		
Center for Health Statistics	17		
Vital Records	20		

The remainder of the interview questions were designed to elicit responses about elements within the conceptual domains of structure, process, outputs, and intermediate outcomes. The entire set of questions was provided to each state in advance and therefore each had the opportunity to prepare responses prior to the telephone call with the project team. States took advantage of this opportunity to varying degrees, with some states clearly having met as a team prior to the telephone call, while others had simply looked over the questions.

In addition to the interview, each state was asked to assemble a packet containing materials that demonstrated the breadth, depth, and capacity of its MCH Epidemiology Effort, including items such as data sharing agreements, reports, presentations, policy briefs, a list of routine data linkages, a list of the databases used in the Title V Needs Assessment, and any other documents it felt would illustrate the status of its MCH Epidemiology Effort. State packets were received between May and October, 2006. Each packet was reviewed by at least two UIC project team members who separately completed an assessment form (Appendix C).

It is important to note that the material included in the state packets might have been generated well before the state interview – a time period when the status of the MCH Epidemiology Effort was perhaps quite different than when the interview took place. For example, a state might have recently lost key staff or gone through a reorganization which weakened its MCH Epidemiology Effort, but sent materials created before these losses. In this case, the responses to the interview with the UIC team would probably reflect less than optimal functioning, while the contents of the packet might reflect a higher level of functioning. Conversely, a state might have recently added senior staff or assignees or otherwise strengthened its capacity, but sent materials created before these gains. In this case, the responses to the interview with the UIC team would probably reflect a higher level of functioning, while the contents of the packet might reflect a lower level of functioning.

Approach to Generating Results

After the state interviews were completed and the packets received, the UIC team created a final measure intended to summarize a state's level of MCH epidemiology functioning. This summary measure was based on two assessments: 1) a review of responses to the telephone interview, along with the summaries provided by the two UIC interviewers, and 2) a review of the materials in the packets sent by the states. Each team member independently assessed the functioning of every state, assigning a value of 1-3 for the interview data and a value from 1-5 for the packet materials. The final summary measure is an average of the two assessments across four reviewers, recoded into a 3-level variable for analysis. The three levels, labeled "below average", "average", and "above average", represent relative levels of MCH epidemiology functioning corresponding to the conceptual model, domains and indicators that formed an *a priori* set of best practices. Table 2 shows the distribution of the states on the summary measure.

Table 2. Assessment of MCH Epidemiology Functioning 50 States and the District of Columbia			
Level of Functioning	# of States	%	The distribution of states on the summary measure of MCH Epidemiology functioning was fairly even, with approximately one-third of the states identified by the UIC team as being above average, average, or below average.
Below Average	15	29.41	
Average	20	39.22	
Above Average	16	31.37	This distribution was not a function of the measurement process itself, as the team members were under no constraint with regard to the placement of a state on the continuum of functioning.
Total	51	100.00	

Using the summary measure as the outcome of interest, the findings that follow are presented as responses to a series of ten questions:

1. How important is it to have a distinct MCH Epidemiology unit within the state agency?
2. Does having a single, identified leader strengthen the MCH Epidemiology Effort?
3. Is there an approach to setting the agenda for the MCH Epidemiology Effort that typifies higher level functioning?
4. What level of staff education and continued training best supports higher level MCH epidemiology functioning?
5. Do CDC assignees, other assignees, fellows, and interns strengthen the MCH Epidemiology Effort?
6. Is having a data environment that promotes data sharing for both internal and external users as well as data integration (linkage) related to MCH epidemiology functioning?
7. Does increasing use of sophisticated epidemiologic methods characterize an MCH Epidemiology Effort that is functioning at a higher level?
8. Are particular approaches for disseminating the work of the MCH Epidemiology Effort associated with enhanced functioning?
9. Do interpretation and translation of data reflect an MCH Epidemiology Effort functioning at a higher level?
10. Is there a relationship between population size and resources, and the level of MCH epidemiology functioning?

For each of these questions, the crude relationship between relevant indicators and the summary measure of MCH epidemiology functioning is explored in bivariate tables along with the results of simple logistic regression modeling. With the three-level summary measure as the outcome variable, results of cumulative logit modeling which considers the summary measure as ordinal, or generalized logit modeling, which considers the summary measure as a set of nominal categories are presented as appropriate.

The cumulative logit model, with its assumption of proportional odds, is shown for those indicators which appear to have a consistent relationship with MCH epidemiology functioning—that is, the relationship is the same (or close to the same) across the ordinal range of below average, average, and above average functioning. In contrast, generalized logit results are shown for those indicators which appear to have a differing relationship with MCH epidemiology functioning, depending on whether the focus is on distinguishing below average from average, or average from above average functioning.

Following univariate and bivariate results, findings from multivariable modeling are presented. Only cumulative logit results are shown in this section since statistical power became more of an issue with the consideration of several variables simultaneously. The narrative accompanying these results, however, includes findings from generalized logit models if they appeared relevant.

Tests of statistical significance are presented throughout, but should be considered with caution. Because the data are for the "sample" of 51 states, power to detect differences is quite low and this is particularly problematic for multivariable modeling. Generally, associations with odds ratios of at least 1.5, and p-values of less than 0.20 were considered of interest to report.

Finally, in order to enhance the interpretation of the interviews and the review of the state packets, a small qualitative analysis that focused on a limited set of questions was also carried out. For this analysis, states were divided into two groups based on an index of macro context variables. The index included the following five variables:

- Population size
- Median household income
- Percent of the population that graduated from college
- Percent of the population that is foreign born
- Percent of children less than five years old that are uninsured

All states greater than one standard deviation below the mean index score were considered “Small with Few Resources” (SFR), and the remaining states were considered “Larger with More Resources” (LMR). For a total of 15 states, transcripts were imported into Atlas/ti for analysis, focusing on each state’s perspective on the obstacles to the practice of data-driven MCH epidemiology and programming, and on how they define and describe their achievements. Results from this review are woven into the reporting of the quantitative results, as appropriate.

Univariate and Bivariate Results

1. How important is it to have a distinct MCH Epidemiology unit within the state agency?

Table 3 displays the states' reports of whether an MCH Epidemiology Effort exists and if so, to what degree it has been formally institutionalized.

Table 3. Organizational Location of the MCH Epidemiology Effort			
	#	%	
Named Unit In Title V	17	33.3	Twenty-one of the 51 states reported having a distinct MCH Epidemiology Unit or Section; for 17 of these, the unit is located within the Title V Program, while for the remaining 4, the unit is housed within the statewide Epidemiology Unit.
Named Unit In Epidemiology Section	4	7.8	
No Named Unit, but Recognized Presence In Title V	15	29.4	Eighteen other states reported an identifiable MCH Epidemiology Effort, although not a specifically named organizational unit; for 15 of these, the Effort is within Title V, while for the remaining 3, the Effort is more broadly construed as spanning the state health agency.
No Named Unit, but Recognized Presence In Title V and Agency-wide	3	5.9	
Diffuse MCH Epidemiology Effort	9	17.7	Twelve states reported having neither a named unit nor a recognized presence: nine of these described their MCH Epidemiology Effort as dispersed and thin, while three reported having nothing that might be termed an "MCH Epidemiology Effort".
No MCH Epidemiology Effort	3	5.9	

Table 4 shows the crude relationship between the organizational positioning of the MCH Epidemiology Effort and the summary measure of MCH epidemiology functioning.

Table 4. Number and Percent of States at Each Level of Functioning by the Organizational Position of the MCH Epidemiology Effort					
Organizational Position	Level of Functioning			Total	Only 1 of the states (8.3%) that described their MCH Epidemiology Effort as diffuse or nonexistent was classified into the above average category of functioning, while 6 of the states (33%) that reported an identifiable MCH Epidemiology Effort and 9 of the states (43%) with a named MCH Epidemiology unit were classified as above average. Conversely, more than half of the states with a weak MCH Epidemiology Effort were functioning at a below average level, while only 14% of states with a named unit were functioning at this low level.
	Below Average	Average	Above Average		
Named Unit	3 14.3	9 42.9	9 42.9	21	
No Named Unit, Recognized Presence	5 27.8	7 38.9	6 33.3	18	
No Named Unit—No or Diffuse Effort	7 58.3	4 33.3	1 8.3	12	
	p=0.09			51	

Table 5 shows the likelihood of being at a higher level of functioning according to the organizational configuration of MCH epidemiology.

Table 5. Crude Cumulative Logit Model for the Association Between Organizational Position of the MCH Epidemiology Effort and Overall Level of Functioning				
	Odds Ratio	95% CI	p	The level of functioning increases as the organizational positioning of MCH epidemiology is strengthened. Having a formal organizational "home" increased the likelihood by more than twofold that a state was classified at a higher level of functioning. Moreover, this relationship was consistent whether distinguishing below average from average functioning, or average from above average functioning (data not shown).
Organizational Position*	2.6	1.3-5.2	<0.01	

* Organizational Position is as shown in Table 4: a 3 level ordinal variable—named unit, no named unit but recognized presence, no or diffuse effort.

2. Does having a single, identified leader strengthen the MCH Epidemiology Effort?

The crude relationship between state reports of having an identified lead MCH epidemiologist and the level of functioning are shown in Tables 6 and 7.

Table 6. Number and Percent of States at Each Level of Functioning by Whether the State Reported Having a Lead MCH Epidemiologist				
Lead MCH Epidemiologist	Level of Functioning			Total
	Below Average	Average	Above Average	
Yes	9 25.0	17 47.2	10 27.8	36
No	6 40.0	3 20.0	6 40.0	15
	p=0.19			51

The vast majority of the states reported having a lead MCH epidemiologist (n=36, 70.6%), but no clear pattern emerges for the relationship between having a lead epidemiologist and the level of functioning. Surprisingly, fewer than one-third of the states reporting a lead epidemiologist (n=10, 27.8%) were classified in the above average category.

The data in Table 6 suggest that the association between reports of having a lead MCH epidemiologist and level of functioning is not linear, given that 85% of the states in the average group (17 out of 20) reported having a single leader—a greater proportion than that reported either by the states in the below average group (60%: 9 of 15) or the states in the above average group (62.5%: 10 of 16). The fact that the proportion of states reporting a lead MCH epidemiologist did not increase in parallel to the level of functioning was also reflected in regression modeling, with the assumption of proportional odds being statistically rejected. Table 7, therefore, presents results of a generalized logit model that considers the impact of reporting a lead MCH epidemiologist first by comparing the above average states with the average states and then subsequently comparing the average states with the below average states

Table 7. Crude Generalized Logit Model for the Association Between Having a Lead MCH Epidemiologist and Level of Functioning					
		Odds Ratio	95% CI	p	
Lead MCH Epidemiologist	a. Distinguishing Above Average from Average				Reporting a lead MCH epidemiologist was not a marker of higher level functioning when comparing the above average to the average states.
	Above Average v. Average	0.3	0.06-1.4	0.13	
	b. Distinguishing Average from Below Average				Conversely, reporting a lead MCH epidemiologist increased by almost four times the likelihood of functioning at a higher level when comparing the average to the below average states.
	Average v. Below Average	3.8	0.8-18.8	0.10	

One possible explanation for the counterintuitive result that the report of having an identified lead MCH epidemiologist does not appear to explain being classified into the highest level of functioning is that more well developed states define leadership differently, not focusing on the presence of a single

individual, but rather on shared leadership. States with this view and this way of operating might have answered "no" to the question of having a lead MCH epidemiologist even when there is an individual who according to job title and administrative category fits this description. In these states, the reality may be that many individuals provide leadership to the epidemiology effort. This distinction between organizational designation and operational approach is important. Moreover, the UIC team's knowledge of the field indicates that many of the high functioning states not reporting a 'single leader' in this analysis, have in fact had sustained leadership by key individuals over time

In the qualitative analysis (data not shown), the profile of a lead epidemiologist varied by the resource capacity of the states; in general, in a state with fewer resources, the "lead" epidemiologist was often a master's prepared individual, while in states with greater resources, the "lead" tended to be an individual with a Ph.D. or MD with prior senior professional experience.

3. Is there an approach for setting the agenda for the MCH Epidemiology Effort that typifies higher level functioning?

Tables 8-11 present findings regarding the agenda-setting process for MCH epidemiology in the states, with particular reference to a process that would reflect the cross-agency, cross-program perspective embodied in what we have called the MCH Epidemiology Effort.

Table 8. Agenda Setting Process for the MCH Epidemiology Effort			
	#	%	
Consensus: MCH EPI staff, Title V Director, and External Partners	20	39.2	Twenty states report an agenda setting process that has both a consensus approach and involves the broadest array of partners; another 16 states report a consensus process, but with somewhat narrower sets of participants. Seven states reported agenda-setting driven by only the lead MCH epidemiologist and the Title V Director, and 8 states reported no unified agenda-setting process.
Consensus: MCH EPI staff and Title V Director	12	23.5	
Consensus: MCH EPI staff	4	7.8	
Lead MCH EPI And Title V Director	7	13.7	
Diffuse, program specific	8	15.7	

Table 9. Number and Percent of States at Each Level of Functioning by Whether Agenda-Setting for the MCH Epidemiology Effort is a Consensus Process					
Consensus Process	Level of Functioning			Total	The majority of states describe setting the agenda for their MCH Epidemiology Effort using a consensus process (n=36, 71%). The association between a consensus approach and the level of functioning is clear, as 30 of the 36 states using this approach were classified as either average or above average, while 60% of the states without a consensus process were classified in the below average group.
	Below Average	Average	Above Average		
Yes	6 16.7	15 41.7	15 41.7	36	
No	9 60.0	5 33.3	1 6.7	15	
	p < 0.01			51	

Table 10 shows the results of a crude cumulative logit model for the association between having a consensus process for setting the MCH epidemiology agenda and enhanced functioning. The proportional odds assumption was not rejected, indicating that the consensus approach is an important factor distinguishing states across all three levels of functioning.

Table 10. Crude Cumulative Logit Model for the Association Between Having a Consensus Process for Setting the Agenda for MCH Epidemiology and Level of Functioning				
	Odds Ratio	95% CI	p	
Consensus Process for Setting the MCH Epidemiology Agenda	8.0	2.2-28.7	<0.01	Having any type of consensus approach for setting the MCH epidemiology agenda was strongly associated with a higher level of functioning overall.

In addition to the critical importance of the consensus process overall as shown above, which partners are involved is also an influential factor in the level of functioning. For example, of the 4 states with a consensus process that includes only MCH epidemiology staff, none were classified into the above average category of functioning, and of the 12 states that involved the Title V Director in addition to MCH epidemiology staff, only 4 were considered as above average (data not shown). On the other hand, of the 20 states that reported a broader involvement in agenda-setting, including MCH epidemiology staff, the Title V Director, and also external stakeholders, 12 (60%) were assessed as functioning at an above average level.

To see a fuller picture of the impact of the variation in the agenda-setting process, Table 11 shows the separate comparisons of broader or narrower participation compared with not having any consensus process for each incremental increase in the level of functioning.

Table 11. Crude Generalized Logit Model for the Association Between Having a Broad or Narrow Consensus Process for Setting the Agenda for MCH Epidemiology and Level of Functioning					
Consensus Process		Odds Ratio	95% CI	p	
a. Distinguishing Average from Above Average					In comparing above average to average functioning, having a relatively narrow consensus process is not enough (OR=1.7, p=0.69), but a process that involves a truly broad set of participants appears to increase by tenfold the likelihood of being classified as above average.
Broad ¹	Above Average v. Average	10.0	0.9-105.9	0.06	
Narrow ²		1.7	0.1-20.6	0.69	
b. Distinguishing Below Average from Average					On the other hand, states with any type of consensus process, regardless of its breadth, are approximately 4 to 5 times more likely to be at an average rather than below average level of functioning when compared to states with no consensus process at all.
Broad	Average v. Below Average	5.4	0.8-37.5	0.09	
Narrow		4.1	0.8-20.2	0.09	

¹ Broad consensus includes internal staff and external stakeholders

² Narrow consensus involves only internal staff

4. What level of staff education and continued training best supports higher level MCH epidemiology functioning?

A higher level of expertise among MCH Epidemiology Effort staff appears to be important for enhancing MCH epidemiology functioning. Tables 12-14 illustrate the impact of having high level staff among the individuals who states identified as the five key members of their MCH Epidemiology Effort.

Table 12. Number and Percent of States at Each Level of Functioning by Presence or Absence of at Least One Key Staff at the Doctoral Level				
Any Doctoral Level Key Staff (PhD or MD/MPH)	Level of Functioning			Total
	Below Average	Average	Above Average	
Yes	9 21.43	17 40.48	16 38.10	42
No	6 66.67	3 33.33	0 0.00	9
	p=0.01			51

Forty-two of the 51 states reported having at least one key staff member at the doctoral level. All 16 states classified as above average reported having at least one staff member with a PhD or an MD/MPH, while none of the states without doctoral level key staff were classified as above average.

Table 13. Crude Cumulative Logit Model for the Association Between Having at Least One Key Staff Member at the Doctoral Level and Level of Functioning				
	Odds Ratio	95% CI	p	
Any Doctoral Level Key Staff (PhD or MD/MPH)	8.7	1.8-41.3	<0.01	Having at least one key staff at the doctoral level increased the likelihood of being classified at a higher level of functioning by more than eightfold. This association was consistently strong whether comparing above average to average states or average to below average states (data not shown).

Expanding on the results for having any doctoral level key staff, Table 14 shows that the level of MCH epidemiology functioning is likely to increase with each additional staff at the doctoral level.

Table 14. Crude Cumulative Logit Model for the Association Between Having Increasing Proportion of Key Staff at the Doctoral Level and Level of Functioning				
	Odds Ratio	95% CI	p	
Total Key Staff at the Doctoral Level	2.9	1.7-5.1	<0.01	There is approximately 3 times greater likelihood of enhanced MCH epidemiology functioning as the number of doctoral level key staff increases.

Beyond the five key staff members, the states also estimated the total number of staff that participate in the MCH Epidemiology Effort and in addition, specifically estimated the proportion of this total who were considered epidemiologists, as opposed to other analytic staff, data managers, computer

programmers or IT staff. Thirty-three states reported that all staff members identified as epidemiologists had at least two formal courses in epidemiology, while six states reported that more than half, though not all of their epidemiologists had at least minimal epidemiology training, and 10 states reported fewer than half of their epidemiologists having formal epidemiology courses. Tables 15 and 16 present results that suggest that having greater than 40% of staff identified as epidemiologists may be a marker of higher level functioning.

Table 15. Number and Percent of States at Each Level of Functioning by Whether More than 40% of MCH Effort Staff are Epidemiologists					
> 40% of Effort Staff are Considered Epidemiologists	Level of Functioning			Total	Slightly more than half of the states in which > 40% of all MCH Epidemiology Effort staff were identified as epidemiologists were classified as functioning at an above average level. Conversely, fewer than 20% of states without this proportion of identified epidemiologists were categorized in the highest level of functioning.
	Below Average	Average	Above Average		
Yes	4 21.1	5 26.3	10 52.6	19	
No	11 34.4	15 46.9	6 18.8	32	
	p=0.04			51	

The association between having greater than 40% of all MCH Epidemiology Effort staff identified as epidemiologists and the level of functioning was statistically significant overall (data not shown), but Table 16 shows that the impact varied when looking at comparisons between each level of functioning.

Table 16. Crude Generalized Logit Model for the Association Between Having More than 40% of the MCH Effort Staff Identified as Epidemiologists and Level of Functioning						
		Odds Ratio	95% CI	P	Having more than 40% of staff identified as epidemiologists increases the likelihood of being classified as above average versus average by fivefold, while having this level of staffing does not appear to be critical in the comparison of states that are average and below average.	
> 40% of Effort Staff Are Considered Epidemiologists	a. Distinguishing Above Average from Average					
	Above Average v. Average	5.0	1.20-20.92	0.03		
	b. Distinguishing Average from Below Average					
	Average v. Below Average	0.92	0.20-4.22	0.91		

In addition to the type of staff and staff expertise, professional networking and staff development opportunities may also be important factors in increasing the level of MCH epidemiology functioning. Attendance at the annual CDC/HRSA sponsored MCH Epidemiology Conference, recognized as the premier specialty meeting for the field of MCH epidemiology, was used as a marker of accessing continued professional growth activities. Based on 2005 conference registration data, which also included information about past conference attendance, the average years of conference attendance was 1.5 (s.d. 1.23). Similar to having a staff with a critical mass of epidemiologists, the association between attending this epidemiology meeting and level of functioning varied depending on which levels of functioning were being compared. Table 17 shows these results.

Table 17. Crude Generalized Logit Model for the Association Between Average Attendance at the MCH Epidemiology Conference and Level of Functioning

		Odds Ratio	95% CI	p	
Mean Years of Conference Attendance	a. Distinguishing Above Average from Average				With each additional year of attendance at the MCH Epidemiology Conference (whether by the same or different staff), states are twice as likely to be classified as above average rather than average.
	Above Average v. Average	2.3	1.1-5.2	0.03	
	b. Distinguishing Average from Below Average				In contrast, conference attendance does not seem to be a significant factor in distinguishing below average from average functioning.
	Average v. Below Average	0.72	0.3-1.6	0.41	

While conference attendance may suggest increased exposure to analytic trainings, collegial support and the exchange of ideas, all of which support higher level functioning, it is also possible that states already functioning at a higher level are more likely to make use of resources such as professional meetings to enhance their activities. The cross-sectional nature of the data prevent a full understanding of the directionality of this relationship.

In addition to the quality of the MCH epidemiology staff in terms of training and expertise, it would make sense that an adequate number of staff overall is also related to a state's capacity to function at a higher level. Table 18 shows how states rated the adequacy of their staffing for MCH epidemiology.

Table 18. Rating of the Adequacy of the Number of Staff Available to Perform Specific Activities

Study Design			Data Collection		
	n	%		n	%
Fair / Adequate	23	45.1	Fair / Adequate	26	51.0
Inadequate	28	54.9	Inadequate	25	49.0
Data Analysis			Data Translation		
	n	%		n	%
Fair / Adequate	24	47.1	Fair / Adequate	19	37.3
Inadequate	27	52.9	Inadequate	32	62.7

Approximately half of the states reported adequate staffing for carrying out data collection, while fewer than half of the states reported adequate staffing for study design, data analysis, or data translation. Particularly low was the percentage of states reporting adequate numbers of staff to translate data.

No association between these ratings of the quantity of staff and the level of functioning was seen (data not shown). One explanation is that there were reporting biases, with higher functioning states under-reporting the adequacy of staffing and lower functioning states over-reporting the adequacy of staffing. This reporting differential could be a reflection of differing expectations and standards of states according to their level of functioning. For example, states that have staff with extensive epidemiologic expertise may in turn have higher expectations for the products of the MCH Epidemiology Effort and

therefore may have underreported the level of their work, whereas states with lower expectations and less staff expertise may have overreported the level of their work.

5. Do CDC assignees, other assignees, fellows, and interns strengthen the MCH Epidemiology Effort?

Given that many states rated their staffing levels as less than adequate, it is important to understand if accessing additional staff resources is a mechanism for boosting the ability to make progress toward higher levels of MCH epidemiology functioning. The use of assignees, fellows, and interns was therefore examined. Table 19 shows the relationship between having assignees in general and having a CDC MCH Epidemiology assignee in particular.

Table 19. Number and Percent of States at Each Level of Functioning by Whether the Effort Used Any Assignee (a.) or a CDC Assignee (b.)									
a. Any Assignee	Level of Functioning			Total	b. CDC Assignee	Level of Functioning			Total
	Below Average	Average	Above Average			Below Average	Average	Above Average	
Yes	4 16.0	9 36.0	12 48.0	25	Yes	4 21.1	6 31.6	9 47.4	19
No	11 42.3	11 42.3	4 15.4	26	No	11 34.4	14 43.8	7 21.9	32
p=0.02				51	p=0.16				51

Among the 25 states that had any type of assignee, 12 (48%) were functioning at the highest level and only 4 (16%) were functioning at the lowest level; among the 26 states who had not accessed extra staff, the pattern is the reverse, with only 4 of these states (15.4%) in the highest category while 11 (42.3%) were functioning at a below average level. While not as pronounced, this relationship is also seen when specifically looking at MCH epidemiology assignees from the CDC.

Integrating assignees into the MCH Epidemiology Effort appears to have a consistently positive impact on whether a state was considered to be at the next highest level of functioning. Table 20 shows these results.

Table 20. Crude Cumulative Logit Model for the Association Between Accessing Any Type of Assignee (a.) or a CDC MCH Epidemiology Assignee (b.) and Level of Functioning							
	Odds Ratio	95% CI	p		Odds Ratio	95% CI	p
a. Any Assignee	4.5	1.5-13.3	<0.01	b. CDC Assignee	2.6	0.9-7.8	0.08
<p>The presence of any assignee (CDC, CSTE, ATPM, etc.) was associated with a significant increase in the odds of being classified at a higher level of functioning.</p>				<p>More specifically, the presence of a CDC assignee was associated with more than a twofold increase in the odds of enhanced functioning, although this association was only marginally significant.</p>			

Moreover, states that had an assignee for at least 5 years were 6.37 times more likely to be at a higher level of functioning than states with no or short-term assignees (CI: 1.03-39.33, p=0.05) (data not shown).

Having interns and fellows was also positively associated with the functioning of MCH epidemiology within states. Table 21 shows the distribution of states across levels of functioning by whether they had ever utilized interns or fellows. Table 22 shows the results of a generalized logit model since the impact of having interns or fellows was not consistent across the range of functioning.

Table 21. Number and Percent of States at Each Level of Functioning by Whether the Effort Used Interns or Fellows					
Used Interns or Fellows	Level of Functioning			Total	The majority of states reported hiring fellows (29 out of 51). Fourteen, or close to half of these, were classified as functioning at an above average level, while only 2 of the states that had never used interns or fellows were considered to be functioning at a higher level.
	Below Average	Average	Above Average		
Yes	7 24.1	8 27.6	14 48.3	29	
No	8 36.4	12 54.6	2 9.1	22	
	p=0.01			51	

Table 22. Crude Generalized Logit Model for the Association Between Accessing Interns or Fellows and Level of Functioning					
		Odds Ratio	95% CI	p	Incorporating interns and fellows into the MCH Epidemiology Effort is a factor specifically important for differentiating between states classified as above average versus average on the range of functioning. Using these additional resources did not appear to be helpful for states at an earlier stage of development
Used Interns or Fellows	a. Distinguishing Above Average from Average				
	Above Average v. Average	10.5	1.9-59.3	<0.01	
	b. Distinguishing Average from Below Average				
	Average v. Below Average	0.8	0.2-2.9	0.70	

Beyond this dichotomous look at having interns and fellows, the impact of the actual count of interns and fellows was also examined in a crude generalized logit model. The results showed that for each additional intern or fellow involved in a state's MCH Epidemiology Effort, the odds of being in the above average versus average category of functioning approximately doubled (OR=2.07, CI: 1.28-3.35, p=0.003), and that again, the impact was not significant when comparing average states with below average states (data not shown)

As already mentioned, these cross-sectional data preclude a full understanding of the sequencing of factors related to MCH epidemiology functioning. In terms of accessing assignees, interns and fellows, it is not clear whether this contributes to enhanced functioning or whether states already functioning at a higher level are more likely to apply for and obtain these additional resources. Historically, assignments were not tied directly to a state's level of functioning, but were based on a combination of factors, including need and state MCH leadership presence. As such, these data do suggest that the infusion of external resources into a state can have a substantial and positive impact on the functioning of the Effort – especially as states move further along the range of functioning.

6. Is having a data environment that promotes data sharing for both internal and external users as well as data integration (linkage) related to MCH epidemiology functioning?

The states were asked about whether MCH Epidemiology Effort staff had direct access to specific databases relevant to MCH and also asked about whether outside users could access these databases. Table 23 shows the results of examining a summative index of access to internal (n=6 datasets) and external (n=5 datasets) data with respect to the level of functioning.

Table 23. Crude Cumulative Logit Model for the Association Between Extent of Data Sharing with MCH Epidemiology Staff (a.) and with External Users (b.) and Level of Functioning							
	Odds Ratio	95% CI	p		Odds Ratio	95% CI	p
Index of <i>Internal</i> Data sharing	1.4	1.1-1.7	<0.01	Index of <i>External</i> Data Sharing	1.3	1.1-1.5	<0.01

A supportive environment for both internal and external data sharing is associated with an MCH Epidemiology Effort functioning at a higher level. Direct access to data for the MCH Epidemiology Effort staff appeared to have a slightly greater effect when comparing above average to average states (data not shown), but as shown here, the impact on the level of functioning was significant overall. Similar results were found when looking at data from the Title V Information System (TVIS), which also asks about access to data for internal users (OR=1.2, 95% CI 1.01-1.5).

It is noteworthy that having internal access to datasets beyond the more typical ones such as vital statistics may be a marker of an MCH Epidemiology Effort functioning at a higher level. For example, access to hospital discharge data (measured both from the UIC interview and from TVIS) and the Youth Risk Behavior Survey (YRBS) are both associated with a higher level of functioning (data not shown). In addition, states were also asked whether they considered data sharing to be routine, sporadic, or rare. Interestingly, 28 states—only 54.9%—reported that data sharing was expected and routine, while 23 states described data sharing as sporadic or rare (data not shown).

Routine integration (linkage) of datasets is another aspect of a well-developed data infrastructure, implying an investment in maximizing what can be learned from data collected and stored for a variety of reasons. As such, routine data integration is expected to be associated with a well developed MCH Epidemiology Effort. Tables 24-27 focus on the extent of data integration and its association with the level of functioning..

Table 24. Extent of Data Integration (Data Linkage)				
	n	%		
Routine	13	25.5	The data integration environment is quite variable across the states, with 13 states reporting that data linkage is routine, 15 states reporting that data linkage is routine as well as sporadic depending on the situation, 18 states reporting that data linkage is sporadic, and 5 states reporting that data linkage is rare.	
Routine and Sporadic (depending on the datasets involved)	15	29.4		
Sporadic	18	35.3		
Rare	5	9.8		

Table 25 uses a dichotomous variable that grouped those states reporting at least some routine data integration and those states which reported rare or at most sporadic data integration.

Table 25. Number and Percent of States at Each Level of Functioning by the Extent of Data Integration (Data Linkage)					
Extent of Data Integration	Level of Functioning			Total	While not statistically significant, these results are suggestive of an association between increased data integration and a higher level of functioning.
	Below Average	Average	Above Average		
Routine*	6 21.4	11 39.3	11 39.3	28	
Sporadic / Rare	9 39.1	9 39.1	5 21.7	23	
	p=0.27			51	

* Including “Routine” and “Routine and Sporadic”

Table 26. Crude Cumulative Logit Model for the Association Between Extent of Data Integration and Level of Functioning				
Data Integration	Odds Ratio	95% CI	p	Increased data integration appears to increase the odds of higher MCH epidemiology functioning by 2.3 (CI: 0.83-6.65, p=0.11). This association, although not significant, was consistent across the range of functioning.
Routine v. Sporadic / Rare	2.3	0.8-6.6	0.11	

A composite variable was created in order to compare states that reported having both permissive data sharing and routine data integration to those that did not. On this composite measure, 18, or only slightly more than one-third of the states, reported having both dimensions of a well-developed data infrastructure. Table 27 displays the results of this comparison.

Table 27. Crude Cumulative Logit Model for the Association Between the Combined Extent of Data Sharing and Data Integration and Level of Functioning				
Data Sharing and Data Integration	Odds Ratio	95% CI	p	States reporting that both data sharing and data integration were routine were 2.6 times more likely to be classified at a higher level of functioning than states with a less well developed data infrastructure.
Routine v. Sporadic / Rare	2.6	0.9-7.9	0.08	

7. Does increasing use of sophisticated epidemiologic methods characterize a MCH Epidemiology Effort that is functioning at a higher level?

Over the past several decades, the expectations for the types of epidemiologic analysis performed by public health agencies have increased. This is certainly true for MCH epidemiology, given the analytic sophistication required to produce high quality five year needs assessments and annual reports, which include target-setting for performance and outcome measures for the Title V Block Grant Application.

Table 28 shows the extent to which states reported the frequency of using some general analytic approaches; Table 29 shows their reports of the frequency of using selected specific analytic techniques.

Table 28. Reports of Using <i>General</i> Analytic Approaches Frequently or Very Frequently								
	Use single, unlinked data sources	n	%			Use linked data sources	n	%
	Yes	47	92.2			Yes	26	51.0
	No	4	7.8			No	25	49.0
	Descriptive analysis	n	%			Multivariable analysis	n	%
	Yes	46	90.2			Yes	16	31.4
	No	5	9.8			No	35	68.6
<p>More than 90% of the states reported carrying out descriptive analysis and using data from single, unlinked sources frequently or very frequently. This is the minimum expectation of any MCH Epidemiology Effort</p>				<p>Fewer than one-third of the states reported carrying out multivariable analysis or using data from linked sources frequently or very frequently. Operating at this level is the expectation for a highly developed MCH Epidemiology Effort.</p>				

Table 29. Reports of Using <i>Specific</i> Analytic Approaches Frequently or Very Frequently				
	Analyzing outcome data by geographic area	n	%	
	Yes	36	70.6	<p>Close to three-quarters of the states reported analyzing health outcomes by geographic area, but fewer than one-quarter reported synthesizing qualitative and quantitative data in an analysis. Even fewer states—only 13.7%--reported conducting analysis which simultaneously considered individual-level and community-level factors.</p>
	No	15	29.4	
	Integrating qualitative & quantitative analysis	n	%	
	Yes	12	23.5	
	No	39	76.5	
	Integrating individual-level and community-level data	n	%	
	Yes	7	13.7	
	No	44	86.3	

Among the measures presented in Tables 28 and 29, only the variable for conducting multivariable analysis differentiated among states across the levels of MCH epidemiology functioning. The statistical results for this association are shown in Table 30.

Table 30. Crude Cumulative Logit Model for the Association Between Using Multivariable Analysis Frequently or Very Frequently and Level of Functioning				
	Odds Ratio	95% CI	p	<p>States that regularly incorporate multivariable analysis into their work are more than two times as likely to be classified at a higher level of functioning.</p>
Multivariable Analysis Frequently or Very Frequently	2.3	0.7-6.9	0.15	

A reasonable question is whether the status of a state's data infrastructure—data sharing and data integration—is related to whether the MCH Epidemiology Effort carries out frequent multivariable analysis. The results in Table 31 suggest that a relationship does indeed exist.

Table 31. Number and Percent of States Conducting Multivariable Analysis by Whether the Data Infrastructure is Well-developed				
Permissive Data Sharing and Routine Data Integration	Frequent Multivariable Analysis		Total	There is a strong association between the presence of a well developed data infrastructure and frequent multivariable analysis—55.6% of the 18 states with a well-developed data environment frequently use multivariable methods, while only 18.1 % with a less conducive data environment frequently do this work.
	Yes	No		
Yes	10 55.6	8 44.4	18	
No	6 18.1	27 81.8	33	
	p<0.01		51	

The fact that the measures for analytic approaches aside from multivariable analysis were not statistically related to MCH epidemiology functioning deserves a comment. Similar to the reporting about the adequacy of the number of staff, it is possible that reporting about the frequency of using specific analytic approaches was biased due to differences in how the states defined "frequently". Higher functioning states may have under-reported frequency and lower functioning states may have over-reported frequency, again reflecting differing expectations and standards of states according their level of functioning,

8. Are particular approaches for disseminating the work of the MCH Epidemiology Effort associated with enhanced functioning?

States use a variety of approaches to disseminate the results of their work, including websites, listservs, paper reports, peer reviewed journal articles, and presentations at local, state, regional and national meetings. Each of these mechanisms is a means for informing and educating stakeholders and the public at large. Table 32 shows the distribution of states using various approaches for disseminating data.

Table 32. Modes of Disseminating Information Used Frequently or Very Frequently			
Oral Presentations	n	%	Not surprisingly, almost all of the states give oral presentations and post information on the Internet frequently or very frequently. Fewer states produce hard-copy reports, likely because of the benefits of Internet posting, and still fewer states use listservs as a dissemination method.
Yes	42	82.4	
No	9	17.6	
Internet Postings	n	%	
Yes	38	74.5	
No	13	25.5	
Hard-copy reports (no external review)	n	%	
Yes	32	62.7	
No	19	37.3	
Listserv Communication	n	%	
Yes	20	39.2	
No	31	60.8	
Peer-Reviewed Articles	n	%	
Yes	5	9.8	
No	46	90.2	

Table 33. Number and Percent of States at Each Level of Functioning by Whether Dissemination Occurs Through Peer Reviewed Publications

Peer-Reviewed Publication at Least Sometimes	Level of Functioning			Total	Slightly more than half of the states (53%) that publish at least sometimes in the peer-reviewed literature were classified in the highest level of functioning, compared to only 21% of the states not using this mechanism.
	Below Average	Average	Above Average		
Yes	4 23.53	4 23.53	9 52.94	17	
No	11 32.35	16 47.06	7 20.59	34	
	p=0.06			51	

Publishing peer-reviewed articles increases by threefold the likelihood of functioning at a higher level overall (p=0.06, data not shown). As seen in Table 34, when separately comparing above average to average and then average to below average, it becomes apparent that publication in the peer-reviewed literature is a marker specifically of the highest level of functioning.

Table 34. Crude Generalized Logit Model for the Association Between Peer-Reviewed Publishing and Level of Functioning

	Odds Ratio	95% CI	p	States that publish at least sometimes in the peer-reviewed literature are five times more likely to be classified as above average rather than average. Peer-reviewed publication does not, however, differentiate between average and below average states.	
Peer-Reviewed Publishing at Least Sometimes	a. Distinguishing Above Average from Average				
	Above Average v. Average	5.1	1.2-22.5		0.03
	b. Distinguishing Average from Below Average				
	Average v. Below Average	0.7	0.1-3.4	0.64	

In addition to peer-reviewed publications, submission of abstracts to the MCH epidemiology conference may be a marker of high-level data dissemination. On average, close to one-third of the registrants from each state submitted an abstract to the conference in 2005. Table 35 shows the relationship between an ordinal measure of abstract submission and increased level of functioning.

Table 35. Number and Percent of States at Each Level of Functioning by the Extent of Abstract Submission to the CDC MCH Epidemiology Conference

Abstract Submission (per registrant)	Level of Functioning			Total	Using a three category variable to reflect no, modest, or more consistent submission of abstracts, there is a strong association between this activity and level of functioning. Among states that did not submit any abstracts, none were classified as above average, while among states submitting at least one abstract for every two registrants, fully three-fourths were classified in the highest level of functioning.
	Below Average	Average	Above Average		
>=50%	2 16.67	1 8.33	9 75.00	12	
<50%	10 37.04	10 37.04	7 25.93	27	
None	3 25.00	9 75.00	0 0.00	12	
	p<0.01			51	

The crude modeling results for the impact of abstract submission to the MCH epidemiology conference were quite similar to those for peer-reviewed publishing, with an overall odds ratio of 2.8 for increasing the level of functioning (95% CI: 1.3-6.4), and again, the association was only meaningful in a comparison of the above average with the average states (data not shown).

9. Do interpretation and translation of data reflect an MCH Epidemiology Effort functioning at a higher level?

Table 36 displays results pertaining to whether and to what extent the MCH Epidemiology Effort is involved with interpreting and translating data.

Table 36. a. The Extent of Involvement in Interpretation and Translation and b. Expectations for the MCH Epidemiology Role in Interpretation and Translation					
	n	%		n	%
Provide Interpretation and Recommendations	30	58.8	Part of the job of MCH epidemiologists	41	80.4
Provide little Interpretation or Recommendations	21	41.2	Not the job of MCH Epidemiologists	10	19.6
<p>Among the 30 states reporting full involvement in translation of data, 27 indicated that this work was carried out in collaboration with others, with only 3 states indicating that MCH epidemiologists did this work in isolation.</p> <p>Of the 21 states reporting minimal involvement of MCH epidemiologists in translation, 19 at least provided initial interpretation, with only 2 states indicating that no interpretation accompanied the reports they produce.</p>			<p>When asked whether translation of data is an expected part of the job of MCH epidemiologists, 41 states said that at least some, if not all, MCH epidemiologists should be involved in this activity.</p> <p>Despite their response, however, 16 of these 41 states were in the group reporting doing little or no interpretation of data (data not shown.)</p> <p>Ten states said that translation was not the role of the MCH Epidemiology Effort.</p>		

While these results indicate that translation is carried out by slightly more than half of the states and viewed as an expected activity by the vast majority, no association was seen with either of these indicators and an increase in the level of functioning (data not shown).

The supplemental qualitative analysis using data from a sample of states provided additional insight into potential contextual influences on data translation activities. Whether small or large and resourced or not, all states indicated that funding and staff were significant obstacles to data translation. Of interest, while staffing was a barrier identified by all states in this small sample, the smaller states specifically reported lacking staff with the skills to perform translation, while, in contrast, the larger states reported having appropriately skilled staff, but too few of these to consistently translate data.

Translation is not only carried out for internal use within the state agency, but external partners need and use this information for their work as well. The states' reports of the extent to which advocates use the products of the MCH Epidemiology Effort are shown Table 37.

Table 37. Reports that Advocates Use the Work of the MCH Epidemiology Effort As the Basis for Proposing Programmatic, Administrative, Legal, or Legislative Change			
	n	%	Two-thirds of the states indicated that external partners use their work frequently or very frequently.
Frequently or Very Frequently	34	66.7	
Sometimes, Rarely, or Almost Never	17	33.3	

For the crude cumulative logit model presented below in Table 38, the extent that external partners use the work of the MCH Epidemiology Effort was not categorized as above, but was instead entered in the model as an ordinal variable in order to maximize statistical power.

Table 38. Crude Cumulative Logit Model for the Association Between the Extent that Advocates Use the Products of the MCH Epidemiology Effort and Level of Functioning				
	Odds Ratio	95% CI	p	As the involvement of external partners increases, the odds of being classified at a higher level of functioning increases by twofold.
Extent that Advocates Use the Work of the MCH Epidemiology Effort	2.0	1.0-3.9	0.05	

The states were also asked to report whether data generated by the MCH Epidemiology Effort was used to develop, modify, or eliminate programs. Action of this type would be another indicator of data translation. Table 39 shows the proportions of states reporting data-driven program change.

Table 39. Reports of Data Being Used to Guide Program Change Frequently or Very Frequently			
Data Used for Program Development	n	%	Approximately half of the states reported that development of new programs and modification of existing ones is guided by evidence produced by the MCH Epidemiology Effort. Only 4 states reported that decisions about program termination were guided by data.
Frequently or Very Frequently	25	49.0	
Sometimes, Rarely, or Almost Never	26	51.0	
Data Used for Program Modification	n	%	
Frequently or Very Frequently	28	54.9	
Sometimes, Rarely, or Almost Never	23	45.1	
Data Used for Program Termination	n	%	
Frequently or Very Frequently	4	7.8	
Sometimes, Rarely, or Almost Never	47	92.2	

While the distributions shown in Table 39 above are interesting in and of themselves, there was no clear relationship between the responses regarding data being used for decision-making and classification as functioning at below average, average, or above average levels (data not shown). A reasonable explanation for this is that the MCH Epidemiology Effort has relatively little control over how the results of its work are used by health agency personnel and policy makers who have final authority for decision-making.

10. Is there a relationship between population size and resources and the level of MCH epidemiology functioning?

To address concern that population size and the resources that typically follow it may make the issues for small states very different than for larger ones, Table 40 shows the level of functioning according to the classification of states used for the qualitative analysis.

Table 40. Number and Percent of States at Each Level of Functioning by Population Size and Corresponding Resources					
	Level of Functioning			Total	None of the eight states categorized as small with fewer resources were considered as having reached a greater than average level of MCH epidemiology functioning; rather, four of the eight states were considered as below average and the remaining four as at an average level of functioning.
	Below Average	Average	Above Average		
Small States with Few Resources	4 50.0	4 50.0	0 0.0	8	
Larger states with More Resources	11 25.9	16 37.2	16 37.2	43	
	p=0.10			51	

As expected, the small states with fewer resources were much more likely not to be functioning at the highest level. Because statistical testing among the smaller states is problematic as there are only eight of them, exact methods were used and results were similar to those seen for the whole group. Of particular interest in these eight small states, having a lead MCH epidemiologist appeared to be an important factor just as it did for all states when comparing average to below average functioning.

Multivariable Results

The following tables show results of multivariable modeling that build on the bivariate results presented above. First, small sets of closely related variables are modeled together, and then these small variable groupings are combined into more complex models. This approach makes it possible to better understand if the factors found to be important in bivariate analyses remain so when considered jointly with other factors or whether their importance is enhanced or reduced. While the sample size of 51 states limited the number of variables that could reasonably be considered in a single model, the statistical results are remarkably strong.

Only results of cumulative logit models that assume consistent associations across above average, average, and below average functioning are presented in the tables that follow, but pertinent findings from separate comparisons of above average and average, and then average and below average states are also discussed.

Table 41 combines the results for question 2, 3, and 4 regarding organizational visibility, leadership, and collaboration.

Table 41. Cumulative Logit Model for the Associations Between Selected Aspects of Organizational Structure and he Level of Functioning

	Odds Ratio	95% CI	p	Having an increasingly formal and visible presence in the state agency, particularly having a named MCH epidemiology unit or section, is associated with a higher level of functioning, as is having an agenda setting process that is based on consensus with an array of relevant stakeholders. Having an identified lead MCH epidemiologist was not associated with increased functioning overall.
Lead MCH Epidemiologist	0.9	0.3-3.3	0.92	
Organizational Position*	2.6	1.2-5.6	0.02	
Agenda-Setting by Consensus Process	8.2	2.1-31.9	<0.01	

* Organizational position is the three level ordinal variable defined in Table 4: named MCH epidemiology unit, no named unit, but recognized presence, and no or diffuse Effort

In data not shown here, visible presence in the agency as well as the consensus approach to agenda-setting remained important factors in separate comparisons of above average versus average functioning and average versus below average functioning. Consistent with the bivariate results, however, having a lead MCH epidemiologist appeared to be important only when comparing states classified as average and below average (OR=4.5, 95% CI 0.7-30.0). Simultaneously examining these three dimensions of organizational structure points to a view of leadership that encompasses more than the presence of a single administratively sanctioned leader. Maintaining organizational visibility and successfully building consensus requires the strong, effective leadership of multiple individuals and the relative importance of these two manifestations of leadership may account for the statistically insignificant results for having a single individual leader when looking at all states combined.

Table 42 combines the results for questions 5 and 6 which focus on aspects of human resources.

Table 42. Cumulative Logit Model for the Associations Between Selected Aspects of Human Resources and Level of Functioning

	Odds Ratio	95% CI	p	The combination of having a critical mass of key staff who have advanced training along with bringing in CDC assignees, fellows, or interns is associated with a higher level of MCH epidemiology functioning.
Total Key Staff at the Doctoral Level	2.4	1.3-4.4	0.01	
>40% of MCH Epidemiology Effort Staff Identified as Epidemiologists	3.0	0.8-10.8	0.09	
CDC Assignee	2.5	0.7-8.4	0.16	
Number of Interns and Fellows	1.5	1.03-2.2	0.03	

For the human resources variables presented above, having doctorally trained key staff and accessing assignees was important along the whole range of functioning. On the other hand, having interns and fellows and greater than 40% of all MCH Epidemiology Effort staff identified as epidemiologists appeared to be stronger markers of being at the highest level of functioning (data not shown).

Reflecting on the components of question 7, the impact on MCH epidemiology functioning of both a permissive data sharing environment along with the institutionalization of data integration (data linkage) is shown in Table 43.

Table 43. Cumulative Logit Model for the Associations Between Selected Markers of a Strong Data Infrastructure and Level of Functioning				
	Odds Ratio	95% CI	p	
# of Datasets Available to MCH Epidemiology Staff	1.3	1.0-1.7	0.03	An environment that promotes and permits data sharing both internally and externally, and increasingly routinized data integration were consistent markers of higher level MCH epidemiology.
# of Datasets Available to External Partners	1.3	1.1-1.5	0.01	
Data Integration Routine	2.1	0.7-6.3	0.19	

Interestingly, increasing availability of datasets to the MCH epidemiology staff appeared to be a stronger marker of the highest level of functioning (OR=1.8, 95% CI: 1.1-2.8), while not as important for distinguishing average and below average functioning (data not shown).

Being cognizant of the limitations of these cross-sectional data, it is noteworthy that publishing at least sometimes in the peer reviewed literature and submitting abstracts to (and presumably presenting at) the annual MCH Epidemiology Conference are associated with a higher level of functioning. While it is uncertain whether these data dissemination approaches lead to increased functioning or vice versa, they are activities that are seen more consistently in higher functioning states as shown in Table 44.

Table 44. Cumulative Logit Model for the Associations Between Selected Markers of a Strong Data Infrastructure and Level of Functioning				
	Odds Ratio	95% CI	p	
Peer Reviewed Publication at Least Sometimes	1.8	1.0-3.3	0.05	Publishing in the peer reviewed literature and submitting abstracts to the MCH Epidemiology conference were both characteristics of higher levels of functioning.
Abstract Submission (per Registrant)	7.5	0.7-80.0	0.10	

Somewhat surprisingly, publishing peer-reviewed articles was generally associated with higher level functioning, regardless of whether comparing states classified as average and below average, or those classified as above average and average. Abstract submission to the MCH Epidemiology Conference, however, appeared more specifically associated with being at an above average level of functioning. (data not shown)

Lastly, Table 45 synthesizes the results seen in Tables 41-43, showing that, on average, states functioning at a higher level can be characterized as those having a combination of structural features. In order to maximize the number of constructs simultaneously considered, the variables for having an assignee and for having interns or fellows were combined into a single measure, as were the variables for having routine data sharing and data linkage.

It is also noteworthy that although not originally highlighted as a distinct dimension of the MCH Epidemiology Effort, the extent of involvement of external partners emerged as a marker of higher level

functioning. In Table 45, involvement by external partners was characterized by inclusion in the process of setting the MCH epidemiology agenda along with having reasonable access to data files.

Table 45. Cumulative Logit Model for the Associations Between Selected Structural Features and Level of Functioning				
	Odds Ratio	95% CI	P	
Organizational Position*	2.0	0.8-4.8	0.14	Factors that appear to be associated with the level of MCH epidemiology functioning include having a consensus approach to agenda setting, having staff with advanced training, supplementing staff by integrating external assignees, fellows, and interns, and having a data infrastructure that promotes ready access to data and one in which the integration (data linkage) is carried out on a more than sporadic basis.
Agenda-Setting by Consensus	6.1	1.1-34.3	0.04	
Agenda-Setting by Consensus Including External Partners	6.6	1.3-33.2	0.02	
Total Key Staff with Doctoral Training	2.5	1.3-5.0	0.01	
Additional Staff: Assignees, Interns, or Fellows	6.4	1.3-32.1	0.03	
Routine Data Sharing (internal and external) & Data Integration Occurring	4.0	0.9-18.3	0.07	

* Organizational position is the three level ordinal variable defined in Table 4: named MCH epidemiology unit, no named unit, but recognized presence, and no or diffuse Effort

Consistent with the crude results, most of these factors appear to be important across the entire range of functioning. There was some suggestion, however, that setting the MCH epidemiology agenda with a consensus process that specifically incorporates external partners, accessing additional staff, and having a more highly developed data sharing and linkage environment were most strongly related with reaching the highest level of functioning (data not shown).

Summary of Findings

Another way to examine the relationships between capacity indicators and level of MCH epidemiology functioning is to compare the proportion of states with particular values, or the average (mean) experience of states within each level of functioning. Table 46 shows these proportions and averages on key indicators. As an example of a proportion comparison, Table 46 shows that approximately one quarter of the states classified as below average or average reported having greater than 40% of their staff being identified as epidemiologists, while more than 60% of the states classified as functioning at the highest level reported this proportion of staff being considered epidemiologists. Looking at the number of interns and fellows used in the past two years as an example of a mean comparison, Table 46 shows that states classified as below average or average used approximately 1 intern or fellow, while the highest functioning states used, on average, close to 4 interns or fellows in the past two years. For each indicator in Table 46, reading across the values gives a sense of the pattern of its relationship with the level of functioning.

Table 46. Percent of States with Selected Factors or Averages on Selected Factors Within Levels of Functioning			
State Reports:	Below Average (n = 15)	Average (n = 20)	Above Average (n = 16)
Structure			
MCH Epidemiology Effort has a Named unit / Recognized Presence	0.53	0.80	0.94
Lead MCH Epidemiologist	0.60	0.85	0.63
Consensus Process for Setting the MCH Epidemiology Agenda (beyond lead MCH epidemiologist & Title V Director)	0.40	0.75	0.94
> 40% of MCH Epidemiology Effort Staff Identified as Epidemiologists	0.27	0.25	0.63
% of 5 Key MCH Epidemiology Effort staff at Doctoral Level	0.15	0.33	0.49
Number of fellows / interns during the past two-years	0.87	1.00	3.88
Total person-years of assignees & fellows	1.60	1.95	6.31
Any Assignee	0.27	0.45	0.75
Average per person attendance at the CDC MCH Epidemiology conference (from 1997-2005)	1.36	1.11	2.08
Number of Datasets Readily Accessible to the MCH Epidemiology Effort (UIC: maximum=6)	3.93	3.95	5.00
Number of Datasets Readily Accessible to the MCH Epidemiology Effort (TVIS: maximum=10)	4.73	5.20	6.94
Number of Datasets Readily Accessible to External Partners (UIC: maximum=5)	1.47	1.90	3.19
At Least One Data Linkage Is Routine	0.40	0.55	0.69
Process			
Data from Linked Data Sources Routinely Used	0.47	0.45	0.63
Descriptive Analysis Routinely Conducted	0.93	0.95	0.81
Multivariable Analysis Routinely Conducted	0.20	0.30	0.44
Output			
Publishing in Peer-reviewed Literature at Least Sometimes	0.27	0.20	0.56
Oral Presentations Frequently Given	0.80	0.80	0.88
Average Percent of Registrants Submitting Abstracts to the CDC MCH Epidemiology Conference	0.29	0.17	0.50
Intermediate Outcome			
MCH EPI Effort staff Performing Translation	0.87	0.70	0.88
Involvement in Interpretation and Translation of Data	0.47	0.70	0.56
Data Regularly Used to Enhance/redirect Programs	0.73	0.45	0.50
Extent that Advocates Use MCH Epidemiology Analyses and Reports (max=5)	3.53	3.60	4.09

The reasons that process factors (except for the use of multivariable analysis) and intermediate outcomes do not appear to be related to level of functioning are probably not the same. As discussed earlier, for process variables such as the sophistication of the data analyses routinely carried out, it is likely that states reported based on their level of expectation and expertise, resulting in misclassification. For intermediate outcomes such as program and policy development, while there may have been some reporting errors, it is also likely that there was little systematic variability among the states—that regardless of the level of functioning of the MCH Epidemiology Effort, having an impact at the program and policy level is difficult, being highly dependent on state budgets, program funders and the political process in general.

Considering both the crude and multivariable results, some measures were found to be related to enhanced functioning overall, while others were primarily associated with distinguishing between either average and below average functioning or above average and average functioning. Table 47 summarizes these findings.

Table 47. Summary of How Selected Factors Were Associated with Level of Functioning		
Markers Associated with Enhanced Functioning Overall	Markers Associated Primarily with Average v. Below Average Functioning	Markers Associated Primarily with Above Average v. Average Functioning
<ul style="list-style-type: none"> Organizational Visibility: a named MCH Epidemiology Unit (or a Recognized Presence) 		
	<ul style="list-style-type: none"> Reports of having an identified lead MCH Epidemiologist 	
<ul style="list-style-type: none"> Consensus process for Setting the MCH Epidemiology Agenda 		<ul style="list-style-type: none"> Consensus process <i>specifically including external stakeholders</i>
<ul style="list-style-type: none"> Key staff at the doctoral level 		
		<ul style="list-style-type: none"> High proportion of staff identified as epidemiologists (as opposed to other data-related titles)
<ul style="list-style-type: none"> CDC or other assignees 		
		<ul style="list-style-type: none"> Using interns and fellows
		<ul style="list-style-type: none"> Attendance at the MCH Epidemiology Conference
<ul style="list-style-type: none"> Ready Access to data for MCH Epidemiology staff 		
<ul style="list-style-type: none"> External users can access data 		
<ul style="list-style-type: none"> Increasingly regular data integration (data linkage) 		
		<ul style="list-style-type: none"> Publishing in the peer-reviewed literature
		<ul style="list-style-type: none"> Submitting abstracts to the MCH Epidemiology conference
<ul style="list-style-type: none"> Advocates use the work of the MCH Epidemiology Effort 		

While the statistical analysis presented thus far identified important associations between structure, process, and output indicators and levels of MCH epidemiology functioning, a closer look at the sixteen states that were classified by this project as functioning at an above average level provides additional insight. The structural features seen in these high functioning states were not identical. In fact, the only factor present in all sixteen states was “having at least one member of the MCH Epidemiology Effort with doctoral training” (either MD or PhD). Following this was agenda setting by consensus, a factor present in 15 of the 16 states. Surprisingly, only 10 of the 16 states reported having a lead MCH epidemiologist, and only 10 had an MCH Epidemiology Effort in which more than 40% of the members were identified as epidemiologists. Finally, only 9 of these states had a named MCH epidemiology unit as the locus of their MCH Epidemiology Effort. This variability even within the highest functioning group illustrates that states are able to compensate, at least in part, for key structural features that are not in place. It is likely, though, that adding those features would facilitate progress toward still higher levels of functioning.

Limitations of the Analysis

It cannot be emphasized too often that the cross-sectional nature of the data collected from the state interviews imposed limitations, and probably masked the dynamic nature of the MCH Epidemiology Effort. As usual with cross-sectional data, it is difficult to determine a temporal sequence, so, for example, it is difficult to know whether having a CDC or other assignee led to enhanced functioning or whether higher level functioning led to the wherewithal to obtain an assignee. In general, recently upgraded structural components such as data sharing policies, data linkage algorithms, budget lines for staff, etc. would not have been in place long enough to impact changes in the shape of the work. In this case, the output of the MCH Epidemiology Effort might look average or below average, requiring some time to “catch up” to the improvements in infrastructure.

On the other hand, in the absence of structural features necessary for sustainability, one state identified what it called the “burnout syndrome” which describes a situation in which a state has highly motivated and qualified staff who are able only temporarily to produce high-level outputs. In this scenario, the level of functioning would not be long lasting. Longitudinal data would be necessary to fully capture the impact of these lags between decreased capacity and decreased output or increased capacity and increased output.

Sample size was also an issue for this analysis, since the total “sample” included only the 50 states and the District of Columbia. Beyond the issue of statistical significance, when no association was found between a variable and the summary measure of MCH Epidemiology functioning, there are possible explanations other than that the variable is truly unrelated to MCH epidemiology functioning. For example, there may have been measurement error; that is, the interview question may not have been sufficiently sensitive and specific to capture variability across the states, and small sample size may have exacerbated any measurement error. On the other hand, lack of variability might have reflected the reality that at the time of the interview, for a particular capacity indicator, states were in fact functioning at the same level, whether that be below average, average, or above average. As states continue to develop MCH epidemiology capacity, however, the variability across states might increase; if a similar survey were conducted in the future, factors not found to be important in this analysis, might indeed be found to be associated with the level of functioning of the MCH Epidemiology Effort.

It is actually quite remarkable that so many of the associations reported here between capacity indicators and a summary measure of MCH epidemiology functioning were not only strong, but reached statistical significance. This suggests that states were willing to provide the project team with fair

assessments of the status of their MCH Epidemiology Effort, resulting as often as not in values on the capacity indicators that varied considerably across the states.

The sensitivity and specificity of indicators, as mentioned above, may have had an impact on the ability to identify associations between capacity indicators and the summary measure of MCH epidemiology functioning. Even for the associations that were identified, however, the sensitivity and specificity as well as the potential for reporting biases varied across indicators, both within and across domains, which means that the relative strength of the reported associations may be imprecise. In addition, there were unequal numbers and types of indicators in each domain, implicitly giving more importance to domains with a greater number of indicators.

Some of the differences in the sensitivity and specificity of indicators was related to the use of terms that themselves lack these traits. This became clear during the interviews, as states asked for clarification of certain terms. For example,

- What is qualitative analysis—does it just mean analyzing open-ended data or does it imply use of particular methods of analyzing that data?
- What is translation –is it high-level interpretation? Is it making program/policy recommendations? Is it seeing change take effect?
- What is access to data—does it mean directly manipulating raw data or does having the ability to request others to manipulate data?
- What is multivariable analysis—does it simply mean considering several indicators simultaneously or does it imply use of particular methods to do so?

It will be important for the field to clarify these and other concepts, and also to refine the expectations of the role of the state level MCH Epidemiology Effort with respect to these as well as other “best” practices at the same time as states continue to move forward.

Synthesis and Recommendations for the Field

As states move forward to enhance their MCH epidemiology capacity, there are a variety of lessons learned from this analysis that can support their efforts and provide direction for next steps. It is evident from this analysis that the MCH Epidemiology Effort is supported by having organizational visibility. While having a named unit is optimal, having a less formal, but recognized presence within the state appears to be important to above average functioning. Although it would make sense that one way to promote organizational visibility is to have an identified leader, this analysis suggested that this may only be important for states beginning to build their MCH Epidemiology Effort. For states that have already achieved a higher level of functioning, leadership may be more broadly construed, defined more by collaborative relationships rather than by a single individual.

In fact, the analysis supports the importance of a collaborative, consensus building process for setting the MCH epidemiology agenda—a process that includes a broad array of partners both within and external to the state health agency. Clearly, states use a variety of mechanisms to enhance their MCH Epidemiology Effort through collaborations. Some examples of collaborative activities include working with universities, specifically Schools of Public Health, and jointly hiring staff; promoting professional relationships with local health departments; and, within the state agency or agencies, establishing cross-program internal working groups to carry out activities of the MCH planning cycle. A collaborative process may also exist with less formal structures as long as the agency supports a broad view of the

MCH Epidemiology Effort. Our qualitative inquiry indicates that states consider the development and improvement of collaborative efforts with internal and external partners as an important marker of their success.

Clearly, the ability to successfully manage a consensus-building process so that it results in work products that reflect a broad view of MCH issues requires strong, effective leadership. The value of having experienced, senior level individuals in advancing the work of the MCH Epidemiology Effort and in building consensus and collaborative relationships should be fully understood and acknowledged, regardless of whether these individuals are formally or informally called the "lead" of the MCH Epidemiology Effort

In fact, the findings presented here show that the presence of key staff with advanced training is a critical element of higher level MCH epidemiology functioning and increasing numbers of such staff is also important. One way to obtain highly trained staff and augment the MCH Epidemiology Effort is to mobilize external resources to add expertise as well as a new perspective on state issues. Moreover, outside expertise can provide the impetus for breaking through the barriers to change imposed by an entrenched data culture that often confronts internal staff. When an individual or individuals from an outside agency work within the state they often bring the imprimatur of their home organization, providing in-state personnel with the additional clout necessary to make change. There are several avenues for obtaining assignees and/or fellows, some requiring the matching of state resources with the external agency's resources, while others do not have this requirement.

Not surprisingly, it appears that states with a permissive data sharing environment are more likely to have a high functioning MCH Epidemiology Effort; if MCH epidemiology staff have access to a variety of datasets and are willing to share data with external partners, the likelihood that the data will be analyzed and translated to answer key program and policy questions is increased. As such, working to achieve a more permissive data sharing environment can be an important step toward increasing a state's ability to effectively use data to improve the health of women, children and families. Likewise, the analysis here suggests that states in which data integration is becoming routine are more likely to have a higher functioning MCH Epidemiology Effort. Given that integrated data provide richer, more complex information than can be gleaned from a single data source, the increased use of such data likely enables states to accurately assess and forecast problems, determine the best interventions and targets to address these problems, and appropriately evaluate whether the interventions the state has developed are making a difference.

States that are able to submit scientific abstracts and publish in peer reviewed journals appear to have MCH Epidemiology Efforts that are more highly functioning. Clearly, these cross-sectional data do not allow us to determine if publications and abstract submissions lead to enhanced MCH epidemiology functioning, or whether states with higher functioning MCH Epidemiology Efforts are more likely to submit scientific abstracts and publish in peer reviewed journals. We can probably assume with confidence, though, that the relationships are synergistic. And as such, states that publish and present their work increase the visibility and utility of their MCH epidemiology enterprise which in turn energizes and enhances future activities. Ongoing participation of states at the annual MCH epidemiology conference also demonstrates an appreciation for the benefits of being engaged with a network of colleagues. Finally, while not reflected in these data, it is likely that states that participate in national networks and whose work has increased visibility and scientific recognition, are attractive as potential employers, as well as to student interns and fellows. While this kind of dissemination is clearly important, it seems easier to achieve than translating the information generated into program and policy change.

It is important to highlight that during the interview with the UIC team, many states explicitly stated that federal initiatives play a critical role in strengthening MCH epidemiology. Mandating more sophisticated reporting is one approach, but equally important is the federal infusion of dollars aimed at promoting higher level functioning. States cite the opportunities to access assignees, fellows, and interns, along with the State Systems Development Initiative as instrumental in helping them increase the capacity of their MCH Epidemiology Effort.

The findings of this report suggest that further development of the field of MCH Epidemiology in state health or related agencies will require implementation of the actions recommended in Table 48. . The recommendations are roughly organized by domain and are numbered to reflect whether the required action will be carried out by the state agency or by the federal agencies that support the field of MCH epidemiology. Many of the recommendations are likely to apply to large urban health agencies as well although these agencies were not included in this study.

Table 48. Recommendations for Action at the State and Federal Level to Support Enhanced MCH Epidemiology Functioning

State health agencies and their associated Title V programs should:	Federal agencies that support the field of MCH epidemiology should:
Organizational Visibility, Leadership, and Collaboration	
<p>S1. Establish a named unit to anchor the MCH Epidemiology Effort, or at a minimum, ensure a specified, visible focus within the Title V Program, the Division of Epidemiology, Center for Health Statistics, or other appropriate location within the state agency.</p> <p>S2. Ensure that the MCH Epidemiology Effort has leadership with organizational recognition and authority, typically a single individual with a job title and administrative responsibilities characteristic of upper level management. This is of particular importance as the MCH Epidemiology Effort is developing.</p> <p>S3. Acknowledge the broad scope of the MCH Epidemiology Effort by breaking down administrative barriers to shared leadership and promoting a broad, collaborative approach to setting the MCH epidemiology agenda that engages both internal and external partners. (For example, while WIC, PRAMS and Title V may be housed in separate administrative structures they are all part of the MCH Epidemiology Effort and should be viewed as such by senior leadership.)</p>	<p>F1. Provide funds for training and technical assistance focusing on strengthening the organizational position of the MCH Epidemiology Effort, on developing collaborative leadership and building consensus, and on effectively working with internal and external partners</p>
Human Resources	
<p>S4. Invest in hiring increasing numbers of individuals with doctoral degrees who can contribute high level expertise and analytic leadership to the MCH Epidemiology Effort.</p> <p>S5. Invest in building an MCH epidemiology staff that is comprised of a critical mass of individuals considered to be epidemiologists.</p>	<p>F2. Continue and strengthen financial support for graduate training in MCH epidemiology at the doctoral and master’s level. To maximize the benefits of these resources, require individuals who receive federal MCH epidemiology targeted funds during their training to conduct their master’s internships or doctoral dissertations in collaboration with state (or</p>

<p>S6. Actively pursue opportunities to obtain supplementary external support and resources for the MCH Epidemiology Effort, such as CDC/HRSA assignees, CSTE fellows, university interns, etc. and support these individuals for a sufficient length of time so that the state fully benefits from their skills and expertise.</p> <p>S7. Provide MCH Epidemiology staff with time and funding to access national and local epidemiology training opportunities.</p>	<p>local) health agencies.</p> <p>F3. Develop an articulated pipeline for graduating MPH and doctoral level trainees in MCH Epidemiology to obtain appropriate positions in MCH Epidemiology in state (or local) health agencies.</p> <p>F4. Continue and expand financial support for the placement of a variety of skilled external staff in state health or related agencies, paid for solely or in part by the federal government (e.g., CDC/HRSA assignee) and through partnerships with organizations and agencies such as CSTE.</p>
Data Infrastructure	
<p>In order to promote sophisticated and informative data utilization:</p> <p>S8. Ensure that MCH epidemiology staff and also external partners have direct access to a wide variety of datasets relevant to MCH—those residing within and outside the state agency</p> <p>S9. Establish protocols for routine data integration (linkage) beyond birth-death data</p>	<p>F5. Expand the use of the Title V Block Grant Annual Report, Application, and Needs Assessment as a mechanism for promoting reporting that requires accessing multiple, integrated data systems to carry out sophisticated analysis.</p> <p>F6. Provide funds for the infrastructure development necessary to fulfill any new Block Grant mandates.</p>
Dissemination and Translation	
<p>S10. Disseminate the work of the MCH Epidemiology Effort using multiple approaches and venues such as the peer reviewed literature and presentations at scientific and professional meetings.</p>	<p>F7. Provide support for joint training of the MCH Epidemiology Effort staff and their internal and external partners on the most effective ways to disseminate and translate their reports and findings into information for action.</p>
<p>S11. Establish mechanisms for MCH Epidemiology Effort staff and other program and policy staff to jointly translate epidemiologic findings into information for executive and/or legislative action.</p> <p>S12. Encourage and support the ability of external partners to turn data into information.</p>	<p>F8. Expand the use of the Title V Block Grant Annual Report, Application, and Needs Assessment as a mechanism for promoting reporting that requires inclusion of policy-relevant interpretation and recommendations for action.</p>

After two decades of capacity-building initiatives following the passage of OBRA 1989, a renewed effort to advance data-based decision-making for maternal and child health is necessary. In addition to the expansion of reporting requirements and provision of workforce training which remain essential activities, the federal government should use its funding authority to provide financial incentives to those states that use the tools of epidemiology to plan, implement, monitor, and evaluate programs and policies. This linkage of funding to data-based decision-making would not penalize states still working to build their capacity, as any state able to document that it is taking concrete steps toward best practices would be rewarded for doing so.

In particular, it will be important to assist states in moving farther along the structure-process-output continuum, since ultimately, the ability to translate data into program and policy change will be the standard against which MCH epidemiology will be measured. In this analysis, the level of MCH epidemiology functioning was not related to whether a state reported data being directly used to guide programmatic and policy change, suggesting that translation is a challenging area for all states, despite the vast improvement in the domains of information resources and human resources that have occurred over

the past twenty years. In addition to recommendations S10, S11, S12, F7, and F8 in Table 48, all of which are approaches for promoting translation, offering new targeted funding to states should also be considered. New funding focusing specifically on data translation activities could further enhance the use of data to inform program and policy. States might use the new dollars to add or train staff in the art and science of producing policy relevant reports, or they might develop more formalized collaborations between the MCH epidemiologists and policy staff, or they might purchase technical assistance to support their ability to do either of these. Offering states the opportunity to apply for funding through either or both SSDI (data infrastructure development) and this new proposed funding initiative (data translation) would provide the flexibility to engage in a range of capacity-building activities tailored to differing state needs.

Finally, it must be recognized that all states, even those already functioning at a higher level cannot be expected to fully engage in evidence-based decision-making unless there is continuing federal and state support for the data infrastructure and databases, including vital records, that are the lifeblood of the MCH Epidemiology Effort.

References

Association of Maternal and Child Health Programs (AMCHP), Guidelines for State MCH Data Capacity, Data Committee, 2001.

Assessment and Monitoring Tool for MCH Epidemiology and Data Capacity, Maternal and Child Health Epidemiology Program, Division of Reproductive Health, Centers for Disease Control and Prevention, 2004

Council of State and Territorial Epidemiologists. National Assessment of Epidemiologic Capacity in Maternal and Child Health: Findings and Recommendations, Atlanta, Georgia: CSTE, December 2002.

Council of State and Territorial Epidemiologists. 2004 National Assessment of Epidemiologic Capacity: Findings and Recommendations. CSTE, Atlanta, GA, 2004.

Donabedian A. Explorations in Quality Assessment and Monitoring: The Definition of Quality and Approaches to Its Assessment. Vol 1. Ann Arbor, Mich: Health Administration Press; 1980.

Handler, A., Geller, S. and Kennelly, J. Effective MCH Epidemiology in State Health Agencies: Lessons from an Evaluation of the Maternal and Child Health Epidemiology Program. *Maternal and Child Health Journal*, 1999; 3(4): 217-224.

Handler, A., Issel, L. M. & Turnock, B. (2001). A conceptual model for the study of public health system performance. *Am J Public Health*, 91, 1235-1239

Rochat, R., Atrash, H. and Handler, A. Developing Maternal and Child Health Epidemiology Capacity in State Health Departments. *Journal of Women's Health and Gender-based Medicine*, 1999; 8(9): 1135-1139.

Ruderman M, Grason H, 2001. Capacity Assessment for State Title V Programs: Preliminary Edition. Baltimore, MD. Women's and Children's Health Policy Center, Johns Hopkins School of Public Health; and Washington DC: Association of Maternal and Child Health Programs.

Turnock BJ and Handler AS. (1997) From Measuring to Improving Public Health Practice. *Annual Review of Public Health* 18:261-82.

Appendix A:
Domains and Indicators of High-Level MCH Epidemiology
in State Health Agencies

STRUCTURE: The STATE HEALTH AGENCY
I. Organizational Vision. The State Health Agency*:
1. Has a demonstrated commitment to evidence-based decision making at the highest level
2. Incorporates MCH epidemiology effort activities into the State’s Strategic Plan
3. Identifies the MCH epidemiology effort, and its relevant partners, in the state’s organizational chart
4. Has mechanisms/policies to promote a supportive environment for timely data sharing, both within and external to the State Health Agency
5. Has policies to facilitate recruiting CDC MCHEP assignees, EIS officers, CSTE fellows, graduate student interns, and other opportunities to enhance analytic capacity
II. Organizational Location. The State Health Agency* situates the MCH epidemiology effort such that:
1. There is a line of direct access to the State Health Agency Director
2. There is direct access to the MCH Director
3. There is direct access to leadership in other divisions and agencies (e.g. Vital Statistics and Medicaid)
4. There is direct access to computer support personnel for maintenance, upgrades, and technical assistance
III. Fiscal Resources. The State Health Agency* budget includes:
1. Sufficient recurring state dollars for the MCH epidemiology effort, including: <ul style="list-style-type: none"> a. A personnel line at an adequate salary level for a lead/senior MCH Epidemiologist b. Sufficient additional personnel lines at adequate salary levels for MCH epidemiologists and MCH epidemiology support staff (e.g., database manager, statisticians, information technology staff, planners, evaluators, communication staff, etc.) to carry out data collection, analysis, translation and dissemination c. Sufficient personnel lines at adequate salary levels for MCH epidemiologists to mentor students, trainees and new hires performing epidemiology work d. Sufficient resources to allow epidemiologists to continually upgrade their skills through additional training, attendance at workshops, participation in distance learning
2. Sufficient non-recurring state dollars for the MCH epidemiology effort, including: <ul style="list-style-type: none"> a. Funding for local demonstration projects b. Funding for special studies of longstanding and emerging MCH problems
3. Sufficient funding for data sharing and the provision of data-related technical assistance to local health agencies
4. Sufficient funding for maintenance and improvement of information systems and computer-related infrastructure
IV. Human Resources. The State Health Agency* ensures that the MCH epidemiology effort has:
1. A lead or senior MCH Epidemiologist
2. Sufficient staff to: <ul style="list-style-type: none"> a. Carry out study design, data collection, analysis, translation and dissemination (e.g., epidemiologists, statisticians, information technology staff, planners, evaluators, communication staff, etc.); b. Mentor students, trainees and new hires performing epidemiology work

Appendix A: Domains and Indicators of High-Level MCH Epidemiology in State Health Agencies

V. Information Systems A. The State Health Agency* has state-of-the-art:	
1. Database servers and web servers	
2. File Transfer Protocol (FTP) capability (e.g., for timely transfer of data between local and state agencies)	
3. Personal computers with adequate memory and storage for all staff	
4. Internet access for all staff	
5. Specialized software to insure PHIN-compliant data warehousing / data linkage	
6. General statistical analysis software, such as SAS, SPSS, or STATA, SUDAAN for all appropriate personnel	
7. Geographic Information System (GIS) software, such as ArcView, and technical support for appropriate personnel	
VI. Information Systems B. The State Health Agency*:	
Has the protocols for:	Implements:
<ol style="list-style-type: none"> 1. Timely and ongoing linkage of live birth, fetal and infant death files 2. Routine creation of an annual cohort of all reproductive outcomes, including abortions 3. Routine linkage of maternal longitudinal files 4. A timely, integrated Child Health Information System, including birth certificates, newborn screening information, birth defects registry, and immunization data 5. Routine linkage of live birth or linked birth/fetal/infant death files with: <ol style="list-style-type: none"> a. Child death (at least to age 6, ideally to age 14) b. Hospital discharge data c. WIC d. Medicaid / SCHIP 6. Routine geo-coding individual record data to latitude-longitude coordinates and integrating it with census geography, 2000 census, and small area census population projections 	<ol style="list-style-type: none"> 1. Timely and ongoing linkage of live birth, fetal and infant death files 2. Routine creation of an annual cohort of all reproductive outcomes, including abortions 3. Routine linkage of maternal longitudinal files 4. A timely and integrated Child Health Information System, including birth certificates, newborn screening information, birth defects registry, and immunization data 5. Routine linkage of live birth or linked birth/fetal/infant death files with: <ol style="list-style-type: none"> a. Child death (at least to age 6, ideally to age 14) b. Hospital discharge data c. WIC d. Medicaid / SCHIP 6. Routine geo-coding individual record data to latitude-longitude coordinates and integrating it with census geography, 2000 census, and small area census population projections
VII. Information Systems C. The State Health Agency* has formal mechanisms to ensure that:	
1. The MCH epidemiology effort has direct access to all relevant State Health Agency data	
2. The MCH epidemiology effort has direct access to all relevant local health agency data	
3. Local health agencies have direct access to state data	
4. External researchers have access to research-oriented data through a formalized, time-efficient mechanism	
5. The public has access to individual-level data that meets confidentiality requirements	
6. The public has access to aggregate (tabular) data	

The “State Health Agency” refers to the state agency concerned with the health of women and children.

Appendix A: Domains and Indicators of High-Level MCH Epidemiology in State Health Agencies

STRUCTURE: The MCH EPIDEMIOLOGY EFFORT
I. MCH Epidemiology Effort Vision. The MCH epidemiology effort:
1. Incorporates a broad vision of MCH including infants, children, adolescents, women of reproductive age, children with special health care needs, as well as their partners/parents/families
2. Includes epidemiologic work carried out by programs such as immunization, WIC, injury, lead surveillance, newborn screening, birth defects, STD/HIV screening and prevention, breast and cervical cancer screening, etc. in addition to work carried out by Title V.
3. Maintains a relevant and dynamic Strategic Plan for its activities
4. Participates in the leadership of the State Health Agency
II. Human Resources. The MCH epidemiology effort:
1. Maximizes collaborative participation and fosters positive relationships among its staff
2. Sets clear goals, positive expectations, and encourages constructive feedback for staff
3. Provides and supports opportunities for professional development of staff
4. Has staff with orientation in MCH service delivery in the United States and who support a broad vision of programs for women and children across the lifespan
III. Organizational Relationships. The MCH epidemiology effort has:
1. Intra- and inter-agency relationships that promote increased analytic capacity and facilitate epidemiologic functioning with: <i>Note: Depending on state agency organization structure, relationships among relevant programs and agencies, such as Title V, WIC, Newborn Screening, Vital Records, State Center for Health Statistics, Medicaid, may be either "intra" or "inter" agency.</i> <ol style="list-style-type: none"> a. Local health and human service agencies b. Local health and social service providers c. Academic institutions, particularly schools of public health d. Professional and other non-governmental organizations e. State human service and other related state agencies
IV. Legal Resources. The MCH epidemiology effort has:
1. Sufficient authority and immunity to establish and implement data sharing agreements within and between state agencies to insure timely access and use of data
V. Capacity Building. The MCH epidemiology effort:
1. Seeks federal funding beyond the block grant for special projects and innovative research
2. Seeks non-federal funding for special projects and innovative research

Appendix A:
Domains and Indicators of High-Level MCH Epidemiology
in State Health Agencies

PROCESS – PRACTICE ACTIVITIES
I. Vision and Analytic Leadership. The MCH epidemiology effort:
1. Establishes frameworks/templates/standards for core data expectations, indicators, and data collection methods related to MCH data for local health agencies, other state agencies, and other MCH providers/programs
2. Accesses relevant information regarding salient MCH research to support MCH “best practices”
3. Advocates and provides expertise for:
4. Developing new and enhancing existing surveillance systems/population risk surveys
5. Developing new and enhancing existing data linkage / data warehousing protocols
6. Provides strategic direction and generates theoretical frameworks for the use of data in policy and program development
7. Provides analytic direction, data tools, and analysis support to state and local agencies for: <ul style="list-style-type: none"> a. Assessment b. Priority setting c. Planning d. Policy development e. MCH-related morbidity and mortality reviews f. Clinical systems improvement initiatives based on the findings of morbidity and mortality reviews g. Special studies of longstanding and emerging MCH problems h. Evaluations of MCH programs i. Program and policy advocacy efforts
8. Facilitates local agency access to state and local data in a readily usable format and in a timely manner
9. Provides training to local health agencies in: <ul style="list-style-type: none"> a. Data system development b. Study design, analysis, and interpretation (quantitative and qualitative) c. Coordination across local areas so that MCH data outputs can be compared
10. Provides training and mentoring of epidemiologists in the state
II. Data Utilization A: Data Collection. The MCH epidemiology effort:
1. Implements primary data collection to address state and local information gaps
III. Data Utilization B: Data Analysis. The MCH epidemiology effort:
1. Analyzes data in order to: <ul style="list-style-type: none"> a. Address priority health issues b. Explore the social determinants of MCH health status and disparities c. Contribute to needs assessments and planning activities including economic analyses d. Assess the availability and acceptability of health facilities and providers to serve MCH populations, and support planning for the delivery of individual health care services e. Assess and respond to emerging MCH issues and sentinel events, as they arise f. Address the quality of health services at the state and local levels g. Respond to requests from the state legislature, the governor, or community or professional groups on an MCH issue, or to respond to media coverage of an issue h. Conduct population based outcome evaluations and to estimate program coverage overall and by geographic area

Appendix A: Domains and Indicators of High-Level MCH Epidemiology in State Health Agencies

2. Analyzes data using sophisticated approaches:
 - a. Integrates data, linked and unlinked, from a variety of agencies and data sources (e.g., PRAMS, BRFSS, YRBS, live birth, fetal death, abortion, linked live birth/infant death data; community health surveys; census data; WIC; birth defects, newborn screening, national health surveys, Medicaid claims, other related administrative program data, etc.)
 - b. Integrates qualitative and quantitative information
 - c. Employs high-level statistical and epidemiologic methods (e.g. stratified analysis, multivariable regression including logistic, Poisson, multilevel modeling, geographic analysis using GIS, trend analysis, etc.)
 - d. Investigates potential associations among socio-demographic factors, risk factors, environmental and other contextual factors, and outcomes
 - e. Investigates potential differences in health outcomes across populations and geographic areas, including comparisons with other states
 - f. Maintains a high regard for data integrity and the conduct of ethical studies

OUTPUTS – PRACTICE RESULTS

I. Dissemination. The MCH epidemiology effort...

1. Generates the following reports:
 - a. An annual state report on MCH status, objectives, and programs, beyond the annual Block Grant and 5 year Needs Assessment submission
 - b. Local surveillance reports
 - c. Special topics reports on MCH health status indicators, risk and protective factors, access to and use of health services, and geographic and/or population disparities
 - d. White papers on issues of importance to the state or local MCH programs
2. Produces reports that include the following content for each of the above reports:
 - a. As appropriate, text, tables, graphs, maps and other material that summarize data analyses into usable information
 - b. As appropriate, content tailored for a variety of audiences at the local, regional, state, and national levels
3. Disseminates reports in the following ways:
 - a. On the Internet
 - b. Via an electronic listserv
 - c. Via mailed paper copies
 - d. In oral presentations for the general public at local and state venues
 - e. In oral presentations at local, state, regional, and national professional meetings
 - f. In published manuscripts in peer reviewed publications (e.g., journals or MMWR)

II. Translation. The MCH epidemiology effort:

1. Generates policy briefs
2. Produces information to strengthen the evidence-base for MCH practice
3. Collaborates with partners within and external to the State Health Agency to advocate for resources, as well as program and policy change, on behalf of the MCH population

III. Capacity Building. The MCH epidemiology effort secures:

1. Federal funding beyond the block grant for special projects and innovative research
2. Non-federal external funding for special projects and innovative research

Appendix A:
 Domains and Indicators of High-Level MCH Epidemiology
 in State Health Agencies

INTERMEDIATE OUTCOMES
I. MCH Expertise. The MCH epidemiology effort is a principal state resource for:
1. Assistance with MCH analytic issues
2. Assistance with the interpretation of MCH data
3. Provision of up-to-date syntheses of state, federal or academic research on salient MCH issues
II. Information Utilization. The MCH epidemiology effort makes it possible for:
1. Consumers and other stakeholders to use high-quality, timely information about MCH populations, needs and priorities, and health status indicators
2. Policy- makers to use high-quality, timely information about MCH populations, needs and priorities, and health status indicators
III. Action Taken. As a by-product of the MCH epidemiology effort:
1. New programs / policies are developed in the state
2. Existing programs / policies are changed or ended
3. Interventions are targeting new populations
4. New legislation is developed and /or existing statutes /regulations are modified / updated
5. Resource allocation formulas are developed / modified

**Appendix B:
State Interview Questions**

The Evaluation of MCH Epidemiology in State Health Agencies

State Interviews

Spring, 2006

Date of Interview: _____ Time: _____ AM / PM State: _____

UIC Project Personnel (circle 2): Amy Arden Deb Joan Roger Russ

State Personnel on Call (verify):

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

Introductions – UIC staff and interview participants.

About the Project (Sample): Before we begin, we would like to remind you of why we are interviewing you. As you know, there have been several projects in the past to assess MCH capacity in state health departments. This project is somewhat different, as we are focusing on organizational competencies – or what we will call the “MCH epidemiology effort”. The data that we collect today will be integrated with data from several secondary sources, such as CSTE and various MCH training data, in order to build a comprehensive dataset about MCH epidemiology in state health agencies. During the summer we will analyze the data, and in early 2007 we will distribute a handbook to you containing a consensus definition of effective MCH epidemiology, that we have worked on with our Advisory Group, as well as multiple approaches for states to enhance their own MCH epidemiologic capacity. A few things about today's interview – the data we collect today will not be used to “grade” or rank you in way – we will use these data to help us identify the relationships between the organization of your MCH epidemiology effort and your epidemiologic activities. Second, we will never report or present an individual-level state data – your data will be analyzed and reported in aggregate with the other states. Do you have any questions for us? If not, let's begin.

Appendix B: State Interview Questions

1. If you are willing, we would like to tape record this interview. Is that all right?
 _____ YES _____ NO

2. Before we talk about MCH epidemiology, please describe the organizational location of the Title V program in relation to other critical programs/sections.

☞ **Check one box per line – PARTICIPANTS DO NOT HAVE THIS GRID**

Programs / Sections	Within the Same Bureau / Division	In a Different Bureau/Division, but in the same State Agency	In a Different State Agency
Center for Health Statistics			
Medicaid			
WIC			
Vital Records			
Other:			
Other:			

3. During the course of this interview we will be using the phrase “MCH epidemiology effort” to refer to the totality of epidemiologic work carried out for MCH in your state. Would you say that there is an identified MCH epidemiology effort in your state? If so, how would you describe its “boundaries”? For example, is it “diffuse”, encompassing epidemiologic work carried out by and for a broad array of MCH related programs, or is it primarily “focused” within the Title V program?

4. In addition to the Title V program, which three programs/units/departments comprise the “core” of your MCH epidemiology effort?

a. _____ b. _____ c. _____

Appendix B: State Interview Questions

5. Given what you have said, which of the following phrases best describes the organizational structure of the MCH epidemiology effort (check one)?
- a. There is a named MCH Epidemiology section/unit within the Title V program
 - b. There is a named MCH Epidemiology section/unit within a statewide Epidemiology Division
 - c. The critical mass of MCH epidemiology is located within the Title V program, but not in a unit, per se
 - d. The MCH epidemiology effort does not have a single location, but is dispersed throughout the state agency
 - e. There is no cohesive MCH epidemiology effort
 - f. Other variations of these models: _____

6. Is there a single individual who is considered the overall leader of the MCH epidemiology effort in your state? YES NO

☞ If YES, who is it? (It may or may not be someone participating in the interview.)

Name: _____

Title: _____

Where does this person sit in the organization? _____
Prompt: In the Title V program? Epidemiology Division/Section? Vital Records? State Center for Health Statistics?

☞ If NO, how would you describe the leadership of the MCH epidemiology effort?

7. Given what you've said about the leadership of the MCH epidemiology effort in your state, which of following phrases best describes how the agenda for the work of the MCH epidemiology effort is set (check one)?
- a. Determined by the lead MCH epidemiologist in collaboration with the Title V Director
 - b. Determined by a consensus-seeking process among a broad group of MCH epidemiology effort personnel
 - c. Determined by the Title V Director alone
 - d. Determined by a consensus-seeking process among a broad group of MCH epidemiology effort personnel and the Title V Director
 - e. Determined by a consensus-seeking process among a broad group of MCH epidemiology effort personnel, the Title V Director and with input of key external stakeholders
 - f. Not determined by any consensus-seeking process, but rather through diffuse, program-specific decision-making
 - g. Other variations of these models: _____

Appendix B: State Interview Questions

8. Overall, how would you describe the extent of coordination of your MCH epidemiology effort as well as the amount of MCH epidemiology activity? For example, do the members of your MCH epidemiology effort meet on a regularly scheduled basis?

☞ *Check the one box that best summarizes this description.*

PARTICIPANTS DO NOT HAVE THIS GRID

Amount of Activity	Coordinated within and across Title V and multiple other MCH-related programs		Coordinated within Title V only		Not Coordinated (Does Not Meet)
	Meets Formally	Meets on an ad hoc basis	Meets Formally	Meets on an ad hoc basis	
Substantial					
Sporadic					
Rare					

9. Do MCH epidemiology effort personnel have ready-access to the following datasets as individual-level, "raw" data for conducting epidemiologic analysis (check all that apply)?
- _____ Vital Record Data
 - _____ Medicaid
 - _____ WIC
 - _____ Hospital Discharge
 - _____ Survey Data (e.g. PRAMS, YRBS, National Children's Health Survey)
 - _____ Other

☞ **Probe for Other Individual-Level, Raw Datasets** _____

Appendix B: State Interview Questions

10. For three of the datasets that you just mentioned, please describe the administrative process for gaining access to the data—how were the data requests made, to whom and in what form (e.g., a mini-proposal, a standard form, a casual email)? What is the typical file format (e.g., SAS, ASCII, etc.)?

Example 1: _____

Example 2: _____

Example 3: _____

☞ *Check one cell in the first three columns and then fill in the last column.*

Examples	Sharing Automatic: No Request Required, or Requests are Ongoing (e.g., annual)	Special Request to Agency-Wide Data Committee (e.g., one-time requests)	Special Request to Program-Specific "Owner" of the data (e.g., one-time requests)	Specify <u>file format</u> (SAS, Excel, ASCII), and <u>Level</u> (Individual v. Aggregate)
Example 1				
Example 2				
Example 3				

11. Can you provide some examples of internal data sharing requests that were denied in the past year and describe why this happened?

☞ *Prompt: Were there HIPAA/legal issues, was it too time consuming, was there an absence of a standardized, analysis-oriented dataset, were you unable to access adequate database documentation, lack of access to appropriate decision-maker, etc.?*

12. In general, for internal users, does the administrative process for accessing data differ according to:
- The dataset(s) being requested? _____ YES _____ NO
 - The type of data user (e.g. permanent or contractual employee)? _____ YES _____ NO

Appendix B: State Interview Questions

13. Do external partners have ready-access to the following datasets as individual-level, "raw" data for conducting epidemiologic analysis (check all that apply)?
- a. Vital Record Data
 - b. Medicaid
 - c. WIC
 - d. Hospital Discharge
 - e. Survey Data (e.g. PRAMS, YRBS, National Children's Health Survey)

➤ **Probe for Other Individual-Level, Raw Datasets** _____

14. For three of the datasets that you just mentioned, please describe the administrative process for gaining access to the data—how were the data requests made, to whom and in what form (e.g., a mini-proposal, a standard form, a casual email)? What is the typical file format (e.g., SAS, ASCII, etc.)?

Example 1: _____

Example 2: _____

Example 3: _____

➤ *Check one cell in the first three columns and then fill in the last column.*

Examples	Sharing Automatic: No Request Required, or Requests are Ongoing (e.g., annual)	Special Request to Agency-Wide Data Committee (e.g., one-time requests)	Special Request to Program-Specific "Owner" of the data (e.g., one-time requests)	Specify <u>file format</u> (SAS, Excel, ASCII), and <u>Level</u> (Individual v. Aggregate)
Example 1				
Example 2				
Example 3				

Appendix B: State Interview Questions

15. Can you provide some examples of external data sharing requests that were denied in the past year and describe why this happened?

☛ *Prompt: Were there HIPAA/legal issues, was it too time consuming, was there an absence of a standardized, research-oriented dataset, were you unable to access adequate database documentation, lack of access to appropriate decision-maker, etc.?*

16. In general, for external users, does the administrative process for accessing data differ according to:

- a. The dataset(s) being requested?
 YES NO
- b. The type of data user (e.g. university researcher, community groups)?
 YES NO

17. Given your description of internal and external data sharing, which of the following phrases best describes the overall data sharing environment in your state health agency (check one)?

- a. Data sharing is expected and routine. Policies are in place to ensure that it can and does occur.
- b. Data sharing occurs sporadically, typically through a special request. Policies are in place, but these assume that this is an occasional, rather than routine, activity.
- c. Data sharing rarely occurs, and when it does it is only through a cumbersome, time consuming process.
- d. Data sharing does not occur.
- e. Other: <Fill in grid below > _____

☛ USE FOR 'OTHER' RESPONSES ONLY

Data sharing is.....	Policies in Place which <u>Encourage</u> Data Sharing	Policies in Place which <u>Inhibit</u> Data Sharing	Policies not in Place
Routine			
Sporadic			
Rare			
Never done			

☛ Segue: “Next, we would like to ask you some questions about human resources...”

18. When personnel are hired to work as part of the MCH epidemiology effort, are they required to have academic training or prior professional experience in maternal and child health?

YES NO

Appendix B: State Interview Questions

19. When personnel are hired to work as part of the MCH epidemiology effort, is there an orientation to MCH provided to these individuals?

_____ YES _____ NO

☞ If YES, what does this orientation consist of?

20. Approximately how many FTEs in your agency address MCH data needs?

- a. Epidemiologists: _____ FTEs
- b. Other Analytic Staff: _____ FTEs
- c. Data Managers: _____ FTEs
- d. Programmers/IT: _____ FTEs

These estimates are for:
 _____ MCH unit only
 _____ MCH EPI effort overall

21. You just told us that you have <answer to 20.a> epidemiologist FTEs - what proportion of these staff have formal academic training in epidemiology (defined as two or more academic courses in epidemiology)? _____%

22. What degrees do the five main staff persons who work in the MCH epidemiology effort possess:

- a. Lead MCH Epidemiologist _____
- b. Four other key MCH epidemiology staff _____, _____, _____, _____

23. How adequate is the number of staff in your agency in terms of carrying out the following aspects of your MCH epidemiology effort to the extent that you would like?

☞ Check one box for each "Activity".

IF SHADED AREA CHECKED, ASK FOLLOW-UP QUESTIONS.

Activity	Very Inadequate (1)	Inadequate (2)	Fair (3)	Adequate (4)	Very Adequate (5)
Study Design					
Data Collection					
Data Analysis					
Dissemination & Translation					

☞ If there is **VERY INADEQAUTE (1)** or **INADEQUATE (2)** staffing in any category, then:

- a. Provide a few examples of work that has not been done because of inadequate staffing.

- b. Have you ever contracted out MCH epidemiology work because there were not enough staff to carry it out internally?

_____ YES _____ NO

Appendix B: State Interview Questions

24. What are some of the barriers, if any, to hiring a senior, lead MCH epidemiologist (check all that apply)?

☛ **If the state has a lead MCH epidemiologist, you could phrase the question, “I know that you have a lead MCH epidemiologist, but if this person were to leave, would there be any barriers to hiring a replacement for him/her?”**

- a. MCH Epidemiology is not a Priority For Hiring
- b. Salary
- c. Location of Health Department
- d. No Qualified Applicants
- e. Freeze on Hiring
- f. No Barriers
- g. Other: _____

25. What are some of the barriers, if any, to hiring the type and caliber of individuals you want for other MCH epidemiology positions (check all that apply)?

- a. MCH Epidemiology is not a Priority For Hiring
- b. Salaries
- c. Location of Health Department
- d. No Qualified Applicants
- e. Freeze on Hiring
- f. No Barriers
- g. Other: _____

26. Has your MCH epidemiology effort included any MCH epidemiology interns or fellows?

YES NO

☛ If YES, in the past two years, how many _____, and how many of these had an assigned mentor _____?

27. Do you have dedicated funds for any of your MCH epidemiology staff to attend MCH meetings as a way to increase their exposure to the MCH and MCH epidemiology community or to promote their professional development? YES NO

☛ *Segue: “Now we would like to ask you some questions about access to statistical software...”*

28. Please describe the situation in your agency in the last 2 years with respect to access to general and specialized statistical software:

Description	General Statistical Software, e.g., SAS, SPSS, STATA	Specialized Statistical Software, e.g., ArcView, SUDAAN	Other
General site licenses (available to all staff)			
Site licenses only within particular divisions/programs			
Software available only to select individuals			
Other: _____			

Appendix B: State Interview Questions

29. Would you say that recurring, state funds are available as needed for expanding and upgrading statistical software? YES NO
30. What, if any, were the major barriers to software access (check all that apply)?
- a. Cost for site licenses
 - b. Policies which restrict access
 - c. Lack of opportunities for training
 - d. No barriers
 - e. Other: _____

☞ *Segue: “Thank you. The next set of questions ask about data linkage, in general. If the process of data linkage varies over time, or according to the databases that are involved, please respond in terms of the process that is most typical/common.”*

31. Who decides which data linkages are a priority?
☞ *Answer in the grid below.*
32. Who has responsibility for the technical development and implementation of linkage algorithms—outside contactors (e.g. universities, internal IT staff, vital records staff, MCH EPI effort staff, other)?
☞ *Answer in the grid below.*
33. Who decides the structure and content of the linked file—the file format and which observations and variables are included—outside contactors (e.g. universities), internal IT staff, vital records staff, MCH epidemiology effort staff, other?
☞ *Answer in the grid below.*
34. Who has access to the linked data—a broad array of staff, only select staff, and/or external partners?
☞ *Answer in the grid below.*

☞ **PARTICIPANTS DID NOT RECEIVE THIS GRID**

	Who decides which data linkages are a priority? (Q.31)	Who does the technical work for the data linkages? (Q.32)	Who decides the structure and content of the linked file? (Q. 33)	Who has access to the linked data? (Q.34)
Internal IT Staff				
Vital Records Staff				
State Center for Health Statistics staff				
MCH Epidemiology Effort Staff				
Title V Director/Staff				
Other MCH-Related Program Staff				
Outside Contractors				
Universities				
Other External Partners				

Appendix B: State Interview Questions

35. What are the barriers, if any, to implementing regularly scheduled data linkages (check all that apply)?

- a. Labor costs—programming, testing, etc.
- b. "Silo" mentality—resistance from the "owners" of the data
- c. Lack of interest—not viewed as important
- d. State policies
- e. No barriers
- f. Other: _____

36. Given what you've told us about data linkage in your state, which of the following phrases best summarizes the data linkage environment (check one)?

- a. Data linkage is regularly scheduled and a priority. Systems are in place to ensure that it can and does occur.
- b. Data linkage occurs sporadically, typically through a special request. Systems are in place, but these assume that this is an occasional, rather than a routine, activity.
- c. Data linkage rarely occurs, and when it does it is only through a cumbersome, time consuming process.
- d. Data linkage does not occur.
- e. Other: _____ <Fill in grid below > _____

☞ Use the grid only to help clarify "Other" responses

Data linkage is ...	Systems are in place to ensure that data linkage occurs	Systems are in place to handle special Requests Only	No systems are in place
Regularly scheduled			
Sporadic			
Rare			
Never done			

☞ *Segue: "Now let's move on to data analysis."*

37. During the past two years, please rank the extent to which data analyses conducted by the MCH epidemiology effort incorporated the following data sources and analytic approaches (record answers on the next page):

Appendix B: State Interview Questions

☞ **PARTICIPANTS HAVE THIS GRID**

	Almost Never (1)	Rarely (2)	Sometimes (3)	Frequently (4)	Very Frequently (5)
Data Sources					
a. Data from un-linked sources					
b. Data from linked data sources					
Analytic Approaches					
c. Descriptive Analysis					
d. Integrating qualitative and quantitative information					
e. Multivariable analytic methods (e.g. adjustment with stratification or regression modeling)					
f. Integrating individual and community level factors (ecologic data)					
g. Information on outcomes by geographic area					
h. Other:					

☞ *Segue: “The next set of questions address how you disseminate findings, and turn your analysis into ‘action’.”*

38. During the past two years, indicate the extent to which the following dissemination strategies were used by your MCH epidemiology effort:

☞ **PARTICIPANTS HAVE THIS GRID**

Dissemination Strategies	Almost Never (1)	Rarely (2)	Sometimes (3)	Frequently (4)	Very Frequently (5)
a. Published on the Internet					
b. Published hard-copy reports (no external peer review)					
c. Published peer-reviewed manuscripts					
d. Electronic listserv					
e. Oral Presentations					
f. Other: _____					

**Appendix B:
State Interview Questions**

39. Which of following phrases best summarizes how data are translated and used for program and policy development?
- a. MCH epidemiologists draw conclusions and make program and policy recommendations based on the data analyses they conduct.
 - b. MCH epidemiologists and others within the agency work jointly to draw conclusions and develop program and policy recommendations.
 - c. MCH epidemiologists provide data reports, including initial interpretation, to others within the agency who then draw conclusions and develop program and policy recommendations.
 - d. MCH epidemiologists provide data reports without interpretation and are not involved in making program and policy recommendations.
 - e. Other: _____
40. The translation of data into information is a function that is expected of (check one):
- a. Most MCH epidemiology effort staff
 - b. Only a select few MCH epidemiology effort staff
 - c. Not a function of the MCH epidemiology effort, per se

➤ *Segue: “Thank you. Now let's discuss the extent to which the MCH epidemiology effort is asked to provide expertise for the analysis and interpretation of data in your state. ...”*

41. Would you say that internal and external partners come to the MCH epidemiology effort as the state's first-line resource for:
- a. Analysis of data? YES NO
 - b. Interpretation of data? YES NO

➤ If YES, what is an example of such a request during the past two years?

Analysis Example: _____

Interpretation Example: _____

Appendix B: State Interview Questions

☞ *Segue: “The final section of this interview deals with the action that results from data analysis, translation and dissemination.”*

42. To what extent are the analyses/reports produced by the MCH epidemiology effort used as evidence for programmatic, administrative, legal or legislative change to:

a. Develop new programs/policies (circle one):

1 – Almost Never 2- Rarely 3 – Sometimes 4 – Frequently 5 – Very Frequently

Example _____

b. Enhance/Redirect a program/policy (circle one):

1 – Almost Never 2- Rarely 3 – Sometimes 4 – Frequently 5 – Very Frequently

Example _____

c. Terminate a program/policy (circle one):

1 – Almost Never 2- Rarely 3 – Sometimes 4 – Frequently 5 – Very Frequently

Example _____

43. To what extent do advocates in the state use analyses/reports produced by the MCH epidemiology effort as the basis for their argument for a programmatic, administrative, legal or legislative change (circle one).

1 – Almost Never 2- Rarely 3 – Sometimes 4 – Frequently 5 – Very Frequently

44. Can you provide some recent examples of when analyses provided by the MCH epidemiology effort were used, but no change occurred? What was the obstacle to action?

Appendix B: State Interview Questions

45. Can you provide some recent examples of program or policy issues for which the MCH epidemiology effort could not provide relevant analyses? Why were analyses unavailable?

➡ *Prompts: Examples may include child injury incidence data, asthma, obesity, small area data analysis.*

46. During the past two years, is there one aspect or success of the MCH epidemiology effort that you would like to highlight?

➡ *Thank the participants and review the evidence submission (next page).*

➡ **UIC Summary (3-4 sentences):** _____

Appendix B: State Interview Questions

Documentation of the State MCH Epidemiology Effort

Please provide this documentation to the UIC team within 6-8 weeks after the interview.

At a minimum, please provide the UIC Team with the following:

1. A selection of special topic reports produced in the last two years (3-5 reports)
2. A selection of issue papers / policy briefs produced in the last two years (3-5 papers/briefs)
3. A list of the databases used in the last Title V Needs Assessment and most recent Block Grant application
4. Data sharing policies
5. List of readily available and usable linked data files

For the topical reports and issue papers, these could be documents directly produced by the MCH epidemiology effort or they could be produced by others with citations for the work of the MCH epidemiology effort (e.g., a legislative proposal, a speech by the governor, a budget request). Please write on the copies you give us indicating who prepared the document and their location in the state health agency or external to the state health agency.

In addition, if feasible, please submit a sampling of other documents produced in the last two years which you believe reflect the breadth and depth of the MCH epidemiology effort in your state. A sample of such documents might include any or all of the following:

1. General reports
2. Manuscripts (peer-reviewed or other)
3. Presentations
4. Examples of computer code
5. Data use guidelines or analysis plans
6. MOUs / MOAs related to data use and sharing
7. Minutes from cross-program MCH epidemiology effort meetings
8. Salary structure
9. Number of current vacancies in MCH epidemiology effort positions

Thank you for your willingness to participate in the “Evaluation of MCH Epidemiology in State Health Agencies” project. Without your time and effort, we could not complete the work that we proposed to do. Once the interviews and subsequent analysis are completed, we will publish a handbook containing a consensus definition of effective MCH epidemiology, along with proposed "best practices". The handbook will be distributed in 2007, and will provide states with multiple approaches for enhancing and institutionalizing their own MCH epidemiologic capacity.

If you have any questions, please contact Amy Herman-Roloff (aherma2@uic.edu).

☛ Send FedEx to (name): _____

Appendix C: State Packet Assessment Tool

The Evaluation of MCH Epidemiology in State Health Agencies Documentation Data Collection Tool Summer, 2006

State: _____

Reviewer: Amy Arden Joan Deb

Reports, Papers, and Policy Briefs

Number Submitted: _____

Topic 1: _____

Topic 2: _____

Topic 3: _____

Topic 4: _____

Topic 5: _____

Others: _____

Evidence of Advanced Data Linkage/Integration (beyond birth, fetal and/or infant death): Yes No

Examples of Linked/Integrated Datasets:

Rank Data Analysis (circle one): 1=Low 2 3 4 5 =High
Rank based on the presence of advanced or innovative methods (e.g., multivariable methods, qualitative data, etc.).

Rank Data Presentation (circle one): 1=Low 2 3 4 5 =High
Rank based on appropriateness, accuracy, and sophistication of tables, graphs, or maps.

Rank Interpretation of Data (circle one): 1=Low 2 3 4 5 =High
Rank based on the accuracy and accessibility of the discussion of findings (e.g., explanation of estimates, measures of association, confidence intervals, etc.)

Evidence of Translation of Data (circle one): Yes No
Did the discussion of findings include providing recommendations and conclusions relevant to program and policy?

Evidence of Action Resulting from Translation (circle one): Yes No
Did action result from the translation provided by the MCH Epidemiology Effort?

Other Comments (please PRINT 2-3 sentences): _____

Global Ranking of State Documentation (circle one): 1=Low 2 3 4 5 =High

Appendix D: Advisory and Reviewer Groups

Advisory Group*

**Group members are listed with the titles and positions they held during the UIC project period.*

<p>Juan Acuna, MD, MSc MCH Epidemiology Team Leader Applied Sciences Branch, Division of Reproductive Health Centers for Disease Control and Prevention</p>	<p>Deneen Long-White, BA Instructor Howard University</p>
<p>Greg Alexander, RS, MPH, SCD (deceased) Professor of Pediatrics and Public Health University of South Florida The Lawton and Rhea Chiles Center for Healthy Mothers and Babies</p>	<p>Susan Nalder, EdD, MPH MCH Epidemiologist New Mexico Department of Health</p>
<p>Karen Bell, MPH (former) Senior Faculty Associate Rollins School of Public Health, Emory University Women's and Children's Center</p>	<p>Riley Peters, PhD Director, Office of Maternal and Child Health Washington State Department of Health (Originally Jan Fleming served in this position)</p>
<p>Brian Castrucci, MA Director, Family Health Research and Program Development Unit Texas Department of State Health Services</p>	<p>LaKesha Robinson, MPH Program Director Council of State and Territorial Epidemiologists</p>
<p>Holly Grason, MA Associate Professor Johns Hopkins Bloomberg School of Public Health</p>	<p>Sherry Spence, MA Maternal and Child Health Consultant</p>
<p>Millie Jones, DPH Family Health Clinical Consultant Wisconsin Division of Public Health</p>	<p>William M. Sappenfield, MD, MPH CDC MCH EPI Program Consultant State MCH Epidemiologist Division of Family Health Services Florida Department of Health</p>
<p>Russell Kirby, PhD, MS Professor Department of Maternal and Child Health University of Alabama at Birmingham</p>	<p>Bao-Ping Zhu, MD, MS (Former) State Epidemiologist Missouri Department of Health and Senior Services</p>
<p>Michael Kogan, PhD Director, Office of Data and Program Development Maternal and Child Health Bureau HRSA / DHHS</p>	

Appendix D: Advisory and Reviewer Groups

Reviewer Group*

**Group members are listed with the titles and positions they held during the UIC project period*

<p>Hani Atrash, MD, MPH Director, Division of Blood Disorders National Center On Birth Defects and Developmental Disabilities Centers for Disease Control and Prevention</p>	<p>Cassie Lauver, ACSW Director, Division of State and Community Health Maternal and Child Health Bureau HRSA / DHHS</p>
<p>Paul Buescher, PhD Director, State Center for Health Statistics North Carolina Division of Public Health</p>	<p>Maggi Machala, MPH, RN Community Health Director South Central District Health Twin Falls ID</p>
<p>Gilberto Chavez, MD, MPH State Epidemiologist California Department of Health Services</p>	<p>Joann Petrini, PhD Director, Perinatal Data Center March of Dimes</p>
<p>Wendy Hellerstedt, MPH, PhD Associate Professor Division of Epidemiology University of Minnesota</p>	<p>Lauren Ratner, MPH, MSW Director, Maternal and Child Health Policy Association of State and Territorial Health Officials (ASTHO) Washington, DC (originally Lauren Raskin Ramos, MPH served in this position)</p>
<p>Laura Kavanagh, M.P.P. Director, Division of Research, Training, and Education Maternal and Child Health Bureau HRSA / DHHS</p>	<p>Nan Streeter, MS, RN MCH Bureau Director Community and Family Health Services Utah Department of Health</p>
<p>Debbie Klein Walker, Ed.D Principal Associate Abt Associates, Inc. Health Services Research and Evaluation</p>	<p>Samara Viner-Brown, MS Chief, Data and Evaluation Division of Community, Family Health, and Equity Rhode Island Department of Health</p>
<p>Milt Kotelchuck, MA, PhD, MPH Professor Department of Maternal and Child Health Boston University School of Public Health</p>	