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Increasing Scientific and Analytic Capacity in States: Extending Epidemiology Collaborations Beyond Traditional Workforce Development

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Many of the articles in this issue of the *Maternal and Child Health (MCH) Journal* showcase examples of the high-level applied research currently being conducted by MCH epidemiologists working in state health agencies. This work is in part a product of a collaboration between the MCH Epidemiology Program (MCHEP) at the Centers for Disease Control and Prevention (CDC) and MCH epidemiology faculty at the University of Illinois at Chicago School of Public Health (UIC-SPH)—a collaboration that provided ongoing, distance-based, advanced training and technical assistance in analytic methods for 7 years. For an in-depth description of this collaboration, see the article by Rankin et al. [1] later in this supplement. This collaboration was one of the many workforce development initiatives designed to build analytic capacity in state and local health agencies sponsored by the CDC, HRSA/MCHB, City-MatCH, the Council of State and Territorial Epidemiologists (CSTE) and others over the past 25 years. As discussed in the commentary in this issue by Phillips et al. [2] these capacity building efforts have taken many forms, including face-to-face workshops, distance-based courses, blended trainings, academic degree programs, fellowships, and internships

There is no doubt that our efforts to strengthen MCH epidemiology practice have been successful—the epidemiologic skill level of the MCH professionals carrying out data-related activities in public health agencies has steadily improved [2]. And in tandem with the array of workforce development initiatives, federally mandated Title V performance measurement and comprehensive needs assessments have spurred the production of more sophisticated reporting and analysis. Even with these successes, however, we still have not achieved the

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scientific capacity in public health agencies that is required to fully support epidemiologic work and maximize its use in informing public health action.

Of course, what we mean by “scientific capacity” is a moving target. New issues emerge, the role of public health agencies evolves, the scope of work of epidemiologists within those agencies changes, and as a consequence, our definition and perception of scientific capacity also changes. Scientific capacity is multidimensional, involving a combination of organizational structure, vision and leadership, and fiscal, human, and technical resources. Therefore, building scientific capacity in states is not just a matter of hiring and training more senior epidemiologists. These epidemiologists face organizational barriers to putting their advanced skills to work, including demands on their time to provide routine reporting and analysis as well as an array of constraints imposed by long-standing structural issues and sometimes intractable health agency norms. To foster improved scientific capacity, then, we must pay more attention to agency-level change. We need initiatives that assist public health agencies to re-configure in ways that support the collection of high quality data, facilitate data utilization, demand data dissemination and translation, and ensure the formal integration of data analysis findings into the decision-making process. If public health agencies move in this direction, the analytic skills of epidemiologists can be put to better use in addressing the needs of the MCH population, and evidence-based decision-making can move closer to being a reality rather than a slogan.

Many in our field believe that an important way to have an impact on scientific and analytic capacity in public health agencies is to put more emphasis on leadership training. Specifically, the case can be made that being in a leadership position that includes administrative authority confers the power and opportunity to shape the work environment in a way that permits state-of-the-art epidemiologic practice. In fact, results of the 2009 CSTE Capacity Assessment clearly showed higher MCH epidemiology functioning in states where epidemiologists identified themselves as having not only scientific authority, but administrative authority as well [3]. Later in this issue, Kroelinger et al. [4] discuss aspects of leadership initiatives that would dovetail with the analytic methods training that has previously been the center of our collaborations.

Leadership training can indeed be a bridge between individual skill building and institutional change. But as we travel down this path, it will be important to distinguish between training in management skills and training in organizational leadership. Organizational leadership requires going beyond managing staff and work flow to being willing and able to interact with the political process. While ensuring scientific objectivity and integrity is of course a primary concern for epidemiologists, we must simultaneously plan and carry out our work with the understanding that garnering political will and encouraging civil engagement are critical to ensuring that scientific work makes a difference. More than 20 years ago, Richmond and Kotelchuck [5] described a model in which social strategies and political will are co-equals with the evidence base in determining health policy. With this perspective, we know that our jobs as MCH epidemiologists and as MCH epidemiology leaders do not end with our contribution to the science of an MCH issue.

If we acknowledge that true epidemiology leadership means challenging the status quo, then new capacity-building initiatives for leadership development will need to address controversial issues. MCH epidemiology leaders will need to grapple with the complex intersection of evidence and the political and social realities of the time, including how socio-political pressures affect both the ability to produce sound evidence in the first place [6] as well as the ability to act on the evidence that does indeed exist. Too often, societal forces bring about support for programs and policies with little or no evidence for their effectiveness in improving the health of MCH populations; conversely, other forces may induce a lack of support for programs and policies when strong evidence for their effectiveness exists. Under these circumstances, what is the role of MCH epidemiology leaders? What is the leadership role when evidence indicates that a historically important program should be eliminated? What is the leadership role when evidence indicates that fundamental social change outside the usual public health sphere may be the solution to an MCH problem? As we plan new leadership development collaborations, we need to be prepared to address difficult questions such as these.

While focusing on leadership training for epidemiologists broadens our thinking about workforce development initiatives, it still focuses primarily on improving individual skills and competencies and only indirectly addresses agency-level change. Fully switching our thinking to how we, as MCH epidemiology leaders, can collaborate to directly address institutional issues is not easy. In our field, we know a great deal about how to train individuals; we know much less about how to creatively “train” (and hence change) organizations. We need to understand what it takes to mobilize organizations to more readily adapt to the ever-changing public health landscape and to manage the disequilibrium that inevitably accompanies any substantial change [7]. The MCH epidemiology community is actually well suited to promote real organizational change since doing so requires the willingness to experiment, to acknowledge errors, to embrace alternative explanations, and to move forward despite uncertainty.

Rosenberg et al. [8] coined the term “MCH Epidemiology Effort” in their assessment of MCH epidemiology functioning in the states to stress the totality of the work that occurs in health and other agencies on behalf of women, infants, children, and families. Emphasizing the “effort” rather than the epidemiologists who work within it helps re-orient us toward organizational as opposed to individual capacity. To be sure, individual capacity is a critical feature of organizational capacity and the two are inextricably linked: a strong organization supports individuals’ professional growth and having a highly skilled workforce stimulates organizational development. In fact, achieving a highly effective MCH Epidemiology Effort requires both understanding and influencing the interplay among all of the elements of organizational functioning, including the skills of the workforce, the configuration and flexibility of the data infrastructure, the presence of effective leadership, the visibility and positioning of MCH epidemiology, the involvement of stakeholders, and the expectations for dissemination and translation of research findings.

The challenge, then, is to envision and implement new collaborations that promote and support scientific capacity in ways that complement traditional workforce development and individual skill building. These new capacity-building collaboratives could focus on a broad

range of issues related to strengthening MCH epidemiology practice. For example, a collaborative process could be aimed at directly improving the data infrastructure in states. Its agenda could include plans to systematically address the limitations of existing data systems—the data elements they do or do not include, measurement and reporting biases, the lack of timeliness, the difficulties in converting administrative data into files suitable for applied research, issues regarding the balance of privacy and data use, and perhaps most importantly, the need for cross-system data integration. Scientific capacity would be improved by a collaborative of this type because the resulting changes in information systems would permit skilled epidemiologists to test hypotheses that reflect the layering and dialectic nature of factors related to MCH outcomes—hypotheses that have not been adequately investigated due to the inaccessibility of appropriate data. Especially now, when health care reform is providing an impetus for reconfiguring data systems, the MCH epidemiology community needs to become an active participant in that process along with establishing our own initiatives aimed at upgrading the data infrastructure.

Another new capacity-building collaboration might be formed to focus on other structural issues. For instance, a collaborative could be established to make recommendations regarding the organizational location of MCH programs and MCH epidemiologists vis-à-vis other programs and other epidemiologists in state agencies. Or, a collaborative could be established to strengthen MCH advocacy efforts by working to identify new avenues for using the scientific work of the MCH Epidemiology Effort across the nation.

These ideas are offered in the spirit of stimulating conversation to move us forward. Make no mistake—the call for new collaborations that focus on data systems, administrative structure, and advocacy is not intended to diminish the continued need for workforce development. This is not an “either-or”, but rather a call for expanding the scope of our capacity-building efforts. Highly skilled epidemiologists and other data-related personnel are critical and we should certainly continue to ensure that health agencies can recruit, develop, and retain high level staff. But we also need to acknowledge that the MCH epidemiologists working in the states, some of whose work appears in this supplement, need the field as a whole to tackle the institutional issues which too often limit their work and its potential to have a positive impact for MCH populations.

With the collective leadership of federal/state/local/tribal health agencies, non-governmental organizations, and university partners, we need to design initiatives that work on multiple fronts: to increase the skill level of the public health workforce, to encourage use of new analytic methods, to promote timely and relevant data systems, to facilitate innovative dissemination strategies, to support advocacy, and to shape new institutional structures and processes. The goal of any collaboration aimed at increasing scientific capacity in state public health agencies must be to galvanize the support and resources necessary to create and sustain a culture and context that facilitates rigorous science and promotes its use to improve the health of women, children, and families.

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