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Promoting a Trained MCH Epidemiology Workforce in State Public Health Agencies Through Strategies Developed From Continued Partnerships

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Background

Maternal and child health (MCH) epidemiology has become a major program component of most state Title V MCH programs [1]. MCH epidemiology is “the systematic collection, analysis and interpretation of population-based and program-specific health and related data in order to assess the distribution and determinants of the health status and needs of the maternal child population for the purpose of planning, implementing, and assessing effective, science-based strategies and promoting policy development” [2], a definition derived from the work of others [3]. Increasing “the proportion of Tribal, State, and local public health agencies that provide or assure comprehensive epidemiology services to support essential public health services[4],” including MCH epidemiology, is of national importance and continues to be recognized as a Healthy People objective [4].

Maternal and child health epidemiology capabilities in state and territorial public health agencies have increased over the last decade. According to national surveys, the percentage of jurisdictions reporting substantial epidemiology and surveillance capacity has increased from 35 % in 2001 to 55 % in 2009, and the percentage reporting minimal to no capacity has

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decreased from 25 % in 2004 to 12 % in 2009 [5]. Moreover, 46 % of jurisdictions have an MCH epidemiologist with a doctoral degree (M.D., Ph.D., and other doctoral degrees), the highest percentage of any public health epidemiology specialty area. This advancement in the MCH workforce occurred because of the strong collaborative efforts of federal public health agencies, academia, and national public health membership organizations [such as the Association of MCH Programs (AMCHP), Council of State and Territorial Epidemiologists (CSTE), and CityMatCH] to bolster MCH epidemiology training at every stage of professional development.

The beginnings of these national efforts to promote a trained MCH epidemiology workforce have been described by others [3, 6, 7]. These early efforts included: (1) the Centers for Disease Control and Prevention's (CDC) MCH epidemiology program (MCHEP) assigning doctoral-prepared career MCH epidemiologists to state and local public health agencies since 1986, with support from the Health Resources and Services Administration's Maternal and Child Health Bureau (MCHB); and (2) MCHB awarding grants to train existing staff through regional perinatal data projects and continuing education programs such as the Enhanced Analytic Skills Program at the University of Illinois at Chicago School of Public Health.

In the 1990s, the state need for trained MCH epidemiologists became more explicit due to new Title V MCH Block Grant mandatory government reporting requirements. In 1993, MCHB launched the state systems development initiative grant program (SSDI) to complement the Title V MCH Block Grant Program. SSDI aims to assure that the Title V agencies have access to policy and program relevant data and continues to address ongoing needs assessments and the improvement of the state's data capacity for evaluating Title V Block Grant performance and outcome measures [8]. As states gained experience in preparing Title V needs assessments and reporting on performance and outcome measures, the need to turn data into information to improve the health of women, children, and families became paramount. In a 2001 survey of state MCH departments, increasing data capacity and skills were identified as the greatest needs [9]. In response, further efforts were undertaken by HRSA, CDC, and other partners to strengthen existing programs and initiate new programs with an emphasis on partnerships. Through these and other efforts, the definition and practice of MCH epidemiology advanced.

As part of this advancement of the field, the core competencies for applied public health epidemiologists, including MCH epidemiologists, have been defined [10]. When examining these competencies, it is clear that the role of MCH epidemiologists has expanded over time, requiring even broader training and skill sets. This expansion challenges the ability of both academic and continuing education programs to train epidemiologists who have both depth and breadth of knowledge and skills [6]. Continued partnerships between federal agencies, academia, and national public health membership organizations need to not only train the workforce to address the professional development needs of MCH epidemiologists, but to also support a multi-focal strategy that promotes the wide range of capabilities and skills needed by state public health agencies to be effective in MCH epidemiology [11].

This multi-focal strategy incorporates every stage of professional development because the ability to hire and train different MCH epidemiologists with a range of skills varies widely across jurisdictions. No one strategy is sufficient to meet the needs, particularly in light of hiring challenges. Only in recent years has the available pool of newly trained MCH epidemiologists increased in some regions of the country. Nonetheless, many agencies still have difficulty retaining staff long term and attracting well-trained staff because of salary levels, geographic location, job preferences, and state hiring procedures. The field has had to use several strategies that have been developed from multiple partnerships to build its current workforce. These strategies are described below, along with other strategies that warrant further development and investment.

Masters and Doctoral MCH Epidemiology Training Programs

One important strategy for building MCH epidemiology capacity has been to increase the number of well-trained MCH epidemiology graduates. The MCH School of Public Health Training Program, funded by MCHB, began in 1947 to prepare MPH graduate students for careers in MCH while emphasizing leadership training, applied research, and technical assistance to communities, states, and regions. In 2001, MCHB launched a separate grant program, the MCH Epidemiology Doctoral Training Program, to provide grant support to one or more doctoral students per university. Originally, nine universities were funded, and eight are currently funded. These students elect a relevant MCH applied epidemiologic analysis as the basis of their research and dissertation, using program information and data from a national, state, county, or city public health agency [8]. This latter effort encouraged many of the training programs in schools of public health to develop a MCH epidemiology track within their doctoral programs. In addition, some began parallel master's programs in MCH epidemiology. These master's and doctoral programs have contributed to the available well-trained workforce.

Internships and Fellowships

The second strategy used by federal and state agencies and academia provides current graduate students, usually in public health, as well as recent graduates, with high quality applied MCH epidemiology experiences in state, tribal, and local public health agencies. This practical experience not only adds to their professional knowledge, skills, and abilities, but encourages participants to explore future careers in state and local settings. This strategy includes internships and fellowships such as CDC's epidemic intelligence service (EIS) Program [12], MCHB's graduate student internship program (GSIP) [13], and the CDC/ Council of State and Territorial Epidemiologists' (CSTE) Applied Epidemiology Fellowship Program [14].

The CDC EIS Program, established in 1951, supports the placement of EIS Officers in states and large metropolitan areas with a focus on MCH issues each year [12]. Placement is contingent upon the mutual interests of states and EIS Officers, who primarily are recent graduates of professional or doctoral programs (M.D., Ph.D., or other doctoral degrees). The EIS Program has served as a launching point for a few key MCH epidemiology leaders, especially in the early years.

Starting in 1992, MCHB began GSIP for graduate students in master's and doctoral training programs, primarily in public health. Approximately 30 interns are assigned each year to state, tribal, and local public health agencies for a 12 week opportunity focused on MCH data analysis/monitoring, needs assessment, and program evaluation [8]. Many of these interns are hired by their assigned agencies upon graduation, or seek training or careers as applied epidemiologists.

The CDC/CSTE Applied Epidemiology Fellowship Program, established in 2003, offers a more extended two-year fellowship in state, tribal, and local public health agencies, including 3–5 fellowships in MCH epidemiology each year. Over this 2 year assignment, these master's- and doctoral-prepared fellows make a major contribution to the agencies to which they are assigned. Upon completing the CSTE fellowship, many fellows are hired by their assigned or another public health agency.

Applied Epidemiology Training for New Career MCH Professionals

The third strategy to increase capacity of the MCH work-force is to provide basic training in applied MCH epidemiology methods and practice to staff in public health agencies; training that likely has not been covered in their undergraduate or graduate training. Since 2002, MCHB and CDC have partnered to offer an annual 3–5 day training course with sponsored travel support. This national program is aimed primarily at relatively new MCH staff in public health agencies that have significant responsibilities for collecting, processing, analyzing, and reporting MCH data. The annual course has been predominantly taught at an intermediate level, with the understanding that this short course cannot serve as a substitute for years of training and experience in applied MCH epidemiology. Topics include program evaluation, needs assessment, small area analysis, trend analysis, multivariate analysis, and multilevel modeling.

Short-Term Skills Building Training

Another important capacity building strategy provides focused knowledge and skills on a particular topic needed by existing applied MCH epidemiologists. For approximately a decade, AMCHP and CityMatCH, in partnership with CDC and MCHB, have offered two-day pre-conference skills building courses at the annual MCH Epidemiology Conference. These hands-on training workshops are designed to teach practical knowledge, methods, and skills needed to inform MCH projects. Training topics have included the perinatal periods of risk (PPOR) approach to prevent infant mortality, scientific writing, leadership training, knowledge translation, trend analysis, regression methods, multilevel modeling, and geospatial methods. With ongoing advances in epidemiologic methods and software, continued training on emerging analytic tools will be needed to enhance and effectively inform MCH programs and policy.

Long-Term Skills Building Training

Recognizing that certain types of knowledge and skills cannot be readily provided in a one-time workshop, since 2003, MCHB has offered technical assistance to public health agencies in writing and publishing practice-related MCH and MCH epidemiology articles, in

order to increase the evidence base. This longer term assistance provided by MCHB's Epidemiology Writing Program includes support in forming the research or practice question, conducting the analysis, as well as writing the actual article. This type of consultation and support is frequently needed by staff who have never written articles for publication [8].

Through another strong collaborative relationship, CDC and the School of Public Health at the University of Illinois at Chicago (UIC) have provided formal training, guided instruction, and mentoring via distance to enhance the analytic skills of CDC MCH epidemiology field assignees, CDC/CSTE fellows, MCH-focused EIS Officers, and other MCH epidemiologists in their assigned agencies. Starting in 2005, this learning collaborative has provided training in key areas such as using critical thinking to determine public health problems, articulating the need for investigation based on literature review synthesis and data assessment, applying epidemiologic principles to make recommendations on data validity, and employing appropriate statistical software. Through a 1–2 year distance-based course, participants have acquired skills in advanced regression modeling techniques; analysis of pregnancy risk assessment monitoring system (PRAMS) data; providing appropriate data to support the MCH Block Grant five year Needs Assessment; and using complex sample surveys to conduct state, regional, and national level analyses. The articles published in this journal issue are the direct results of this effort.

Expanding the Competencies for Effective MCH Epidemiology Practice

The most recent survey of state MCH/Title V programs in state health agencies conducted by AMCHP in conjunction with academic partners found that the greatest identified need among state Title V staff was translation of data into information [1]. In some ways, this finding indicates that the strategy of focusing on increasing data capacity and skills has been successful, and now, while continuing to maintain those gains, we must turn our attention to the next stage: providing information to the public and policymakers in a timely and understandable fashion. The MCH workforce could benefit from a better understanding of how to effectively communicate epidemiologic findings to program and policy entities to maximize the impact of MCH research on the health of women and children. One approach that will help to enhance communication involves implementing a better balance between problem-focused research (e.g. identifying and describing the problem) and solution-focused research (e.g. conducting evaluations and policy analyses) given that epidemiologic research, as it currently stands, generates too little evidence to inform effective programs and policies, particularly those that address inequities [15].

Translation of data is a challenging area for all states. One recent study reported that MCH epidemiology functioning in states was frequently unrelated to their use of data to guide programmatic and policy change [11]. Before we can address this challenge and increase translation capacity in state and local settings, it is important for the field to first provide a clear definition of this concept. As Rosenberg and colleagues [11] question, "Is translation synonymous with dissemination, or is it making program and policy recommendations, or are data not truly translated until change occurs?" Translating data effectively into evidence-based information will be needed by public health leadership to help make important

funding, policy, and programmatic decisions, as such efforts will be the standard against which MCH epidemiology will be measured [11].

Additionally, state public health agencies are being encouraged to implement the life course approach to MCH, which many have already embraced. This approach is being integrated into their analytic and programmatic work to help reduce disparities and adverse MCH outcomes throughout the lifespan [16]. However, as with translation, there are challenges with implementing the life course approach given that much remains to be explored with respect to measuring its effectiveness, particularly while the science is still under development. MCH program and epidemiology staff in state agencies will require additional support and training as the field transitions to new approaches to “counting” and “measuring” the impact of initiatives focused on the social determinants of health across populations and across the lifespan.

Future Challenges and Opportunities

Advances in the magnitude and skills of the MCH epidemiology workforce in state public health agencies over the past 25 years have occurred because of the strong partnerships of federal and state public health agencies, academia, and national public health membership organizations. Most of these efforts are now also focusing on tribal and local public health agencies. Our challenge will be to expand these partnerships and efforts, including those involving a broader emphasis on translation and the life course approach to improve MCH programs, policies, and systems. This expansion will be difficult given that state and federal budgets have been reduced and will probably be reduced further.

In these difficult times, states will have to find ways to maintain MCH epidemiology capacity and ensure that their MCH staff is well-equipped with the expertise to examine data, policies, and programs. A multi-focal approach is needed by public health agencies to sustain a leaner but more capable MCH epidemiology workforce, as no one or two training strategies are sufficient. Agencies must blend their ability to hire new graduates and staff as needed and to further train less experienced staff to play a larger role. For this to be achieved, the development and maintenance of strong partnerships within and across the branches of government, as well as between government and academia, must continue in order to have a well-trained workforce in MCH epidemiology.

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