

Improving Maternal and Child Health Across the Life Course: Where Do We Go from Here?

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In 2003 when Dr. Halfon and I published a commentary in this journal calling for a reconceptualization of racial–ethnic disparities in birth outcomes from a life-course perspective [1], few people in maternal and child health (MCH) were talking about life course. While certainly not new, it was hailed in an accompanying editorial as “a start in a new paradigm” in MCH [2].

The past decade has witnessed major advancements in the development of the life course theory and its application to MCH research, practice, and policy. In this issue, Halfon et al. [3] summarized new advances in the theory of life course health development (“LCHD 2.0”), while other articles provide a sample of the many innovative applications in our field. There are now websites, toolboxes, resource guides, and a research network devoted to MCH life course, and the federal Maternal and Child Health Bureau (MCHB) of the Health Resources and Services Administration is now using the life course theory as a strategic planning framework, guiding the work of the Bureau and its grantees and partners over the next decade [4]. There has been a paradigm shift in MCH, and as proclaimed in an editorial in 2009, “[t]he *life course* has come of age” [5].

So where do we go from here? The collection of articles in this issue of the *MCH Journal* provides a good roadmap. In this editorial, I will offer three further suggestions for how to advance life course research, practice, and policy in MCH. In research, we need to move beyond discovery to

intervention research. In practice, we need to move from isolated to collective impact. In policy, we need to move beyond paying for remediation to investing in capacity formation.

Beyond Discovery to Intervention Research

Despite all that we have learned over the past 30 years about how health and disease develop over the life course, there is still much that we do not know. In this issue, Russ et al. [6] identified a number of priorities for MCH life course research including epigenetic mechanisms underlying biological embedding and their potential mutability; peri-conception as a critical and sensitive period for environmental exposures; maternal health prior to pregnancy; the role of the placenta as a master-regulator of the intra-uterine environment, and ways to strengthen early mother–child interactions. They called for a research agenda with greater emphasis on longitudinal rather than cross-sectional studies, life-course rather than short-term perspectives, trans-disciplinary rather than discipline-specific approach, multiple causes-multiple outcomes rather than single cause-single disease epidemiological inquiry, study of multi-generational rather than single generational cohorts, and improved training in effective interdisciplinary collaboration, advanced research methodology and higher-level statistical modeling. Similarly, Halfon et al. [3] called for a research agenda that would accelerate convergence of health development sciences and systems biology frameworks, new discoveries in environmental epigenetics, and development of new longitudinal data cohorts, new assays and measures including measurement of positive health, and new classification schemas which go beyond disease classifications to evaluate functional capacities.

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While these are all important research priorities for MCH, there is one more area that merits greater attention: life-course intervention research. Whereas over the past 30 years there has been an explosion of basic and epidemiological research demonstrating how health and disease develop over the life course, presently there is still a paucity of well-designed intervention studies with long-term follow-up demonstrating what works and what doesn't in preventing disease and promoting health over the life course. For example, despite a growing body of evidence suggesting the critical role that early nutrition plays in developmental origins of health and disease [7], few intervention studies have been designed with sufficient duration of follow-up to evaluate the benefits of early nutritional interventions for child or adult health outcomes. This leaves an open question as to how best to prevent child obesity, early-onset type II diabetes or adult metabolic syndrome with early nutrition intervention programs.

In MCH life course research we need to move from discovery to intervention research. While discovery research is still needed, our field cannot get stuck in the discovery phase. What we need are well-designed intervention studies to demonstrate what works and what does not in disease prevention, and health promotion and optimization across the life course. Such research has its challenges, including costs and methodological issues related to long-term follow-up. Such research will also have to address a number of key design issues, such as

- Interventions—What have we learned from discovery research to inform the design of an intervention study to address a particular priority outcome (or a set of related outcomes)? Will the study use single intervention or multiple interventions? Single level or multi-level? While single interventions are useful in isolating what works and what does not, a “bundle” of interventions, addressing multiple determinants and perhaps at multiple levels, may produce larger, synergistic effects.
- Timing—What is the optimal window for intervention on a particular outcome? What is the best timing for “preconceptional” intervention? Is there a “sensitive” or “critical” period for youth violence or teen pregnancy prevention? Is there dynamic complementarity between early and later interventions for a particular priority outcome [8]?
- Data collection—What data should be collected about the pre-disease pathway—the early and long-term biological, behavioral, psychological and social precursors to a particular outcome [9]—that the intervention is designed to alter? What data is needed to establish the biological plausibility or economic returns of an intervention?

Given the challenges and costs of this type of research, a good place to start is by establishing a research agenda that will (1) set priorities for MCH life course intervention research, and (2) coordinate research activities among researchers as well as investments across funders that will help accelerate the generation of an evidence base to inform practice and policy in preventing disease and promoting and optimizing health over the life course.

From Isolated to Collective Impact

Over the past decade, there has been a groundswell of federal, state, and local efforts to translate life course theory into MCH practice. This issue of the *MCH Journal* highlights some of the most innovative applications of the life course theory in our field. Frey et al. [9] describe the efforts of Wisconsin's MCH program to operationalize the life course theory that includes expansion of preconception and women's health initiatives, integration with traditionally “non-MCH” programs such as chronic disease programs, and shifting Title V resources from provision of individual services to assurance of effective early childhood systems. Shrimali et al. [10] describe Alameda County Public Health Department's countywide multi-sector initiative to engage community partners in improving neighborhood conditions, which includes creating a shared vision statement and bill of rights that connects diverse stakeholders to common goals, launching a web-based learning community, and implementing innovative programs such as Food to Families that advance health equity from a life course perspective. Parthasarathy et al. [11] also describe the Building Economic Security Today (BEST) program, Contra Costa Health Services Life Course Initiative's asset development pilot project to reduce inequities in health outcomes for low-income families by improving their financial security and stability. And Allen et al. [12] describe the Healthy Start in Housing (HSiH), an innovative partnership between Boston Public Health Commission and the Boston Housing Authority that addresses some of the challenges and possibilities of an intervention based on life course theory.

Much of current applications of the life course theory in MCH follow one or more of three major themes. First, there are *early and preemptive interventions*. A primary message of the life course theory is to intervene when it counts the most, which in many cases may be earlier than what has been done in the past, such as preventing child obesity by improving prenatal nutrition, or preventing adverse birth outcomes by improving women's preconception health. [13]

Second, we look at *multilevel, cross-sector interventions*. Another important message of the life course theory

is to do what matters the most, which in many cases may not be healthcare [12]. Halfon et al. [3] contend that rather than attempting to address childhood obesity in the pediatrician's office, it may be more effective to move the nexus of prevention and preemptive intervention to the schools, day care centers, parks and recreational facilities, or WIC sites. Kotelchuck and Fine [4] call for a “whole-person, whole-family, whole-community systems approach” to addressing important social determinants, such as education, housing, poverty, father absence, and racism, operating across the life course, that may be the “root cause” of health disparities in MCH.

Third, there is the theme of *multidimensional systems integration*. The need to intervene across multiple levels, multiple sectors and even multiple life stages require not only better service coordination but greater systems integration. Several articles in this issue discuss the three dimensions of systems integration—vertical, horizontal, and longitudinal [14–17]. With vertical integration we are looking at appropriate levels of care (e.g. perinatal regionalization). Horizontal integration refers to service coordination and systems integration not only within healthcare but also across multiple sectors—education, economic, and community development. And, longitudinal integration focuses on the continuum of care across the life course, especially across transition points [13, 15, 18–20].

Yet despite growing recognition of the need for broad, early and preemptive, multilevel, cross-sector interventions that require not only better service coordination, but greater systems integration (vertical, horizontal, and longitudinal), much of MCH still work in siloes—age siloes, disease siloes, organizational siloes, disciplinary siloes, data siloes, communication siloes, often created or exacerbated by different legislative authorities, funding streams, and accountability requirements. These siloes lead to what Kania and Kramer [21] termed “isolated impact,” an approach oriented toward finding and funding a solution embodied within a single organization. Yet as they pointed out, “the complex nature of most social problems belies the idea that any single program or organization, however well managed and funded, can singlehandedly create lasting large-scale change.” They argued instead that “substantially greater progress could be made in alleviating many of our most serious and complex social problems if nonprofits, governments, businesses, and the public were brought together around a common agenda to create collective impact.”

This goes beyond the usual “interagency collaboration” in MCH. Unlike most collaboration, collective impact initiatives typically have five conditions that produce true alignment: common agenda, shared measurement systems, mutually reinforcing activities, continuous communication, and backbone organizations. As Kania and Kramer [21]

observe, “The expectation that collaboration can occur without a supporting infrastructure is one of the most frequent reasons why it fails.” Collective impact initiatives require separate “backbone organizations” with dedicated funding and skilled staff that can provide overall strategic direction, facilitate dialogue and mediate conflicts between partners, manage data collection and analysis, handle communications, coordinate community outreach, and mobilize financial support and political will [10, 22].

To accelerate translation of the life course theory to MCH practice, we need to move from isolated to collective impact. Instead of supporting single organizations working in siloes, we need to promote organizations working together, across sectors and siloes, facilitated by a common agenda, shared measurement systems, mutually reinforcing activities, continuous communication, and backbone organizations to achieve greater collective impact.

Beyond Remediation to Capacity Formation

One of the most important applications of the life course theory in MCH policy in the last decade is the Affordable Care Act (ACA) [23]. The ACA improves access to healthcare across the life course by prohibiting denial of coverage based on pre-existing conditions (guarantee issue). Insurers cannot drop someone who becomes ill (guarantee renewability), and ACA also bans lifetime limits on how much insurers will cover if one gets sick. The ACA also extends dependent coverage up to age 26, and expands Medicaid eligibility, community health centers and school health centers which will improve access for some of the most vulnerable children and families in our nation. Over the next few years millions of uninsured women will get healthcare coverage, including coverage for clinical preventive services without copay, which will provide an extraordinary opportunity to improve women's health not only during pregnancy, but before, between and beyond pregnancy and across their life course.

At MCHB, under the leadership of its previous Associate Administrator, Dr. Peter VanDyck, the life course theory was adopted as a guiding framework for the Bureau's strategic planning [4]. Since my arrival at MCHB, I have been using the life course theory primarily as an investment guide—what does the life course theory tell us about how we should be investing in MCH, and what must we do differently, as a Bureau and as a nation, if we are to optimize life course health development of our nation's children and families?

One thing that is becoming clearer to me is that while remediation has its place, as a nation we have to figure out how to move beyond paying for remediation toward investing more in capacity formation. Borrowing from the

work of the Nobel laureate economist Dr James Heckman, life success in America today depends greatly on three capacities which are formed in early childhood: cognitive, non-cognitive (what some refer to as socio-emotional or relational skills, motivation, self-regulation, resilience, and so forth), and health [24]. “The accident of birth is a principal source of inequality in America today,” Dr. Heckman argues. “American society is dividing into skilled and unskilled, and the roots of this division lie in early childhood experiences” [15]. Development of these capacities depends on the quality of the early nurturing environment. Poor nurturing and toxic stress can alter gene expression and disrupt the developing brain [25].

Early interventions can improve life chances for success by improving capacity formation, especially among disadvantaged children (*disadvantaged* not only or even primarily in socioeconomic terms, but in nurturing). Heckman [24] contends that investing in early interventions will have much greater economic return than paying for later remediation efforts that are the focus of conventional public policy debate: reducing pupil-teacher ratios; providing public job training, convict rehabilitation programs, adult literacy programs, and tuition subsidies; and spending on police. Remediation still has a place, but because of the multiplier effects of early interventions—“skills beget skills and capabilities foster future capabilities”—economic return to later interventions is greater if the base is stronger [24].

Maternal and Child Health Bureau is doing its part to improve the life chances of some of the nation’s most vulnerable children through our Healthy Start program, Maternal, Infant, and Early Childhood Home Visiting program, and other programs. These investments are particularly critical for children with special needs, for whom early interventions can have dramatic impact on capacity formation and alter their life-course trajectories. But we can do more, and we can do better. That is how we have been using the life course theory—to help us continue to look for opportunities where our investments can make a bigger difference for MCH. Where we depart from earlier, more deterministic life course models is that we believe those opportunities are not limited to early childhood, that capacity formation does not stop at birth or at age five (even most ardent proponents of early interventions recognize that “advantages gained from effective early interventions are best sustained when they are followed by continued high quality learning experiences”).

We also recognize that we cannot do it alone. Children spend most of their early childhood in three domains: home, child care, and health care. And the three basic building blocks of capacity formation in early childhood are family nurturing, quality child care/early childhood education, and medical home (or better yet, health home).

Children in poor families and impoverished neighborhoods have less access to these building blocks. We can build an integrated platform to raise children out of poverty by aligning our MCHB programs (Healthy Start, MIECHV, etc.) with (1) Early Head Start, (2) Head Start, (3) Community Health Centers, (4) Project Launch, (5) WIC, and others, and we can achieve even greater collective impact if these early childhood interventions are also better aligned with (6) quality education (e.g. Promise Neighborhoods) and (7) neighborhood revitalization (e.g. Choice Neighborhood), especially if these federal efforts are reinforced by public–private partnerships at the state and local levels.

Conclusion

As Dr. Milton Kotelchuck noted in the aforementioned editorial back in 2003, “For me, the critical issue is whether this [life course] model changes the way the MCH field conceptualizes the origins of racial disparities, or changes the research question we ask, or changes the policies and practices we use to ameliorate those disparities” [2]. This issue of the *MCH Journal* demonstrates that we are well on our way to that. But to truly unleash the power of the life course theory, we need to move beyond discovery to intervention research, from isolated to collective impact, and beyond remediation to investing in capacity formation across the life course.

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