



The Centrality of Law for Prevention

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The field of prevention science has been instrumental in the development and testing of strategies to promote mental, emotional, and behavioral (MEB) health among children and youth. Yet, despite an abundance of scientific evidence of effective programs, little progress has been made in scaling up and creating structural change to support healthy development for all children (Fagan et al. 2019; National Academies 2019). The National Academies of Sciences, Engineering, and Medicine's (the National Academies) Board on Child, Youth, and Families consensus study report entitled *Fostering Healthy Mental, Emotional, and Behavioral Development in Children and Youth* (National Academies 2019) concludes that a national agenda including institutional and policy change is central to achieve improved and lasting outcomes at the population level. The 2019 report is the third in a series on MEB development published since 1994 that have synthesized evidence and provided recommendations for promotion of healthy development and prevention activities (Institute of Medicine 1994; National Research Council and Institute of Medicine 2009; National Academies 2019). The 2019 report includes a greater emphasis on achieving population-level effects through institutional and policy change. "This emphasis reflects the fact that despite the development of programs that are effective in supporting healthy MEB development in individuals and groups of children and youth, successful population-based efforts that can broadly counter adverse environments and experiences that threaten healthy MEB development for so many of the nation's young people have not materialized." (p. vii). Conclusions of the consensus study highlight broad societal factors, such as poverty, inequality, and discrimination, as key influences on MEB health, and recommend a coordinated national agenda to address healthy

MEB development universally with particular attention to geographic areas of concentrated disadvantage.

Given its emphasis on achieving population-level effects, the 2019 consensus study dedicated a chapter to research on policies (National Academies 2019). In this chapter, guided by conceptual frameworks of policy effects on child health and health equity (Komro et al. 2011, 2014; Solar and Irwin 2010), I illustrate the multitude of laws and central mechanisms through which laws may influence child health (Fig. 1). Below, I briefly summarize research from a few key areas included in the commissioned paper that I wrote for the consensus study, including results from foundational public health law research on the effectiveness of laws designed to protect children from physical harms and emerging research on policies that address social determinants of health. The long-standing fields of injury prevention and alcohol and tobacco control have often pointed the way on use of strong research designs such as controlled time-series to assess effects of laws on health. Sophisticated research methods are increasingly being applied evaluating health effects of laws that affect the upstream social determinants of health.

Laws that Protect from Physical Harms

Injury Prevention

There is strong science behind the effectiveness of laws designed to prevent child injury. Quasi-experimental studies have found that laws requiring child safety seat use result in substantial increases in correct use of child restraint, reductions in crash injury rates, injury hospital expenditures, and motor vehicle fatalities (Eichelberger et al. 2012; Mannix et al., 2012; Pressley et al. 2009). Studies have concluded that bicycle helmet legislation results in an increase in the use of bicycle helmets among youth, and a corresponding decrease in head injuries among children (Karkhaneh et al. 2006; Macpherson and Spinks 2008). Graduated driver licensing laws have been found to reduce crash rates and injuries among teen drivers, with stronger laws associated with greater fatality reductions (Russell et al. 2011). There is inconsistent evidence

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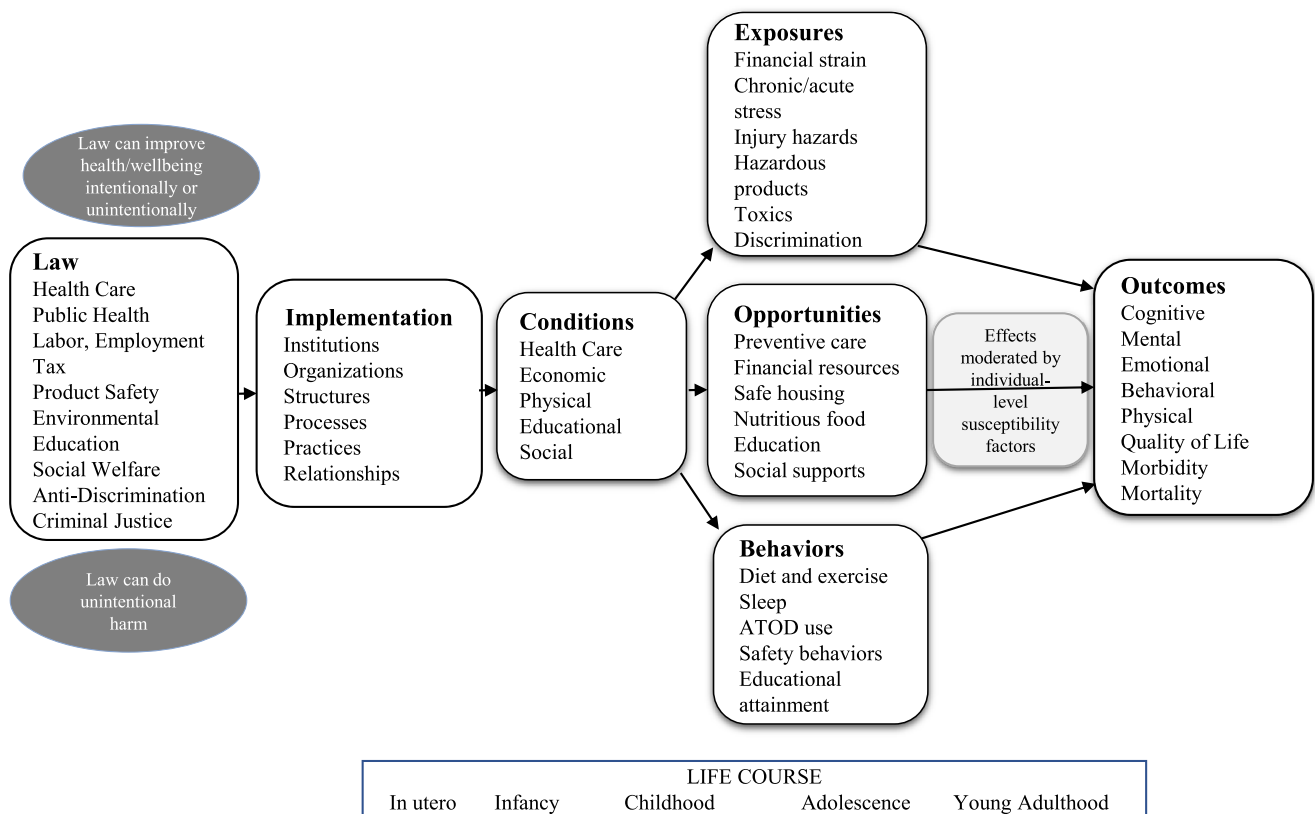


Fig. 1 A causal framework for law's effects on child development and health (adapted from National Academies of Sciences, Engineering, and Medicine 2019; Komro et al. 2014)

of whether firearm access prevention laws (i.e., safe storage) and juvenile age restrictions prevent firearm injuries, with some evidence that the strength of the law is related to the size of beneficial effects (Gius 2015; Hamilton et al. 2018; Parikh et al. 2017).

Research can also indicate when law is ineffective, or poorly implemented. For example, concussion-related policies for youth athletes typically do not address primary prevention, instead dealing with responses to a concussion, such as criteria for removal from play, requirements for evaluation, requirements for return to play, and information dissemination. Following implementation of such laws, a study found that emergency department visits and neurologist visits continued to increase at the rate they did before implementation (Gibson et al. 2015), indicating the laws are ineffective.

Alcohol, Tobacco, and Other Drug Control

Decades of quasi-experimental studies have provided a solid scientific basis for concluding that effective policies designed to prevent and reduce alcohol-related harms among youth include raising the minimum drinking age to 21, increasing alcohol excise taxes, and imposing liability on social hosts (US Department of Health and Human Services 2016a). In addition, laws that deal specifically with drinking and driving,

such as zero tolerance for any alcohol concentration among minors, result in declines in alcohol-related traffic fatalities (US Department of Health and Human Services 2016a). Similarly, effective youth tobacco prevention policies include restricted access to tobacco products and tax and price increases (US Department of Health and Human Services 2012). Use of e-cigarettes is a rapidly emerging public health concern which are now the most commonly used tobacco products among youth (US Department of Health and Human Services 2016b). Research is needed to study the effects of new legal and regulatory efforts to prevent initiation among youth. Research is also needed to study effects of newly enacted medical and recreational marijuana laws. Initial studies have found that states with decriminalized or legalized marijuana have higher rates of unintentional overdose among young children, usually through ingestion (Onders et al. 2016; Wang et al. 2014). Initial studies on adolescent marijuana use have been inconsistent (Cerda et al. 2018; Kerr et al. 2017; Sarvet et al. 2018).

Limit Toxic Environmental Exposures

For decades, laws have addressed air, water, and land pollution, although enforcement of such laws is currently at risk and new laws will likely address threats from global warming.

Yet, there is limited research that has examined effects on such laws on child health and development. Two important examples of this line of research are studies that have documented long-term effects from key federal legislation regulating clear air and exposure to lead. Isen et al. 2017 analyzed long-term effects of the Clean Air Act of 1970 on air quality at birth and subsequent adult labor market outcomes. They found that better air quality at birth was associated with improved educational attainment, earnings, and later-life health. A report from the Health Impact Project of the Robert Wood Johnson Foundation (2017) summarized research findings that indicated a 94% decline in average blood lead levels among children following key federal legislation to reduce lead exposure enacted during the 1970s to 1980s. Further research is critically important to study effects of new laws to regulate or deregulate exposures to toxic environmental exposures on child health and develop.

Laws Promoting Family Economic Security

Family Income

There is growing evidence that enhancing family income through such policies as the Earned Income Tax Credit (EITC) and minimum wage laws affects family and child well-being. Numerous studies indicate that federal and state EITCs positively affect families' economic circumstances; increase participation in the labor force, particularly by single mothers; reduce poverty, including child poverty; improve educational outcomes among children; and improve health outcomes among mothers and children (Gassman-Pines and Hill 2013; Sherman et al. 2016; Spencer and Komro 2017). Studies of state minimum wage laws find that increases in minimum wages are associated with improvements in prenatal care, birth weight, and fetal growth; and decreases in low birth weight, post neonatal mortality, and maternal smoking (Komro et al. 2016; Wehby et al. 2020). Higher minimum wage laws also appear to be associated with lower reports of neglect for children ages 0 to 12 years (Raissian and Bullinger 2017) and lower adolescent birth rates (Bullinger 2017), yet higher rates of binge drinking and alcohol-related traffic fatalities (Adams et al. 2012; Hoke and Cotti 2015). Research on health and well-being effects of these and other related policies (e.g., child tax credit, paid family leave) designed to support family economic security is important to guide future policy decisions.

Housing

Studies have found that receipt of housing vouchers among families with children results in reduced homelessness, crowding, housing instability, and family poverty (Center on

Budget and Policy Priorities 2017). Yet recipients of housing vouchers tend to live in only slightly less disadvantaged neighborhoods (Ellen et al. 2016; Horn et al. 2014). Evidence also suggests that rental voucher programs may reduce exposure to crime and neighborhood social disorder, but further research is needed to understand effects on youth outcomes (Anderson et al. 2003).

Nutrition Assistance

The Supplementary Nutrition Program for Women, Infants, and Children (WIC) has been found to improve nutrition and health of low-income families, and importantly improves academic achievement among children. Studies also indicate the benefits of the Supplemental Nutrition Assistance Program (SNAP), including reduction of food insecurity among children, family purchases of healthier food, fewer low-birth-weight births, and improved child health (Carlson and Keith-Jennings 2018). The National School Lunch Program is associated with the consumption of more nutritious food and lower rates of family food insecurity (Ralston et al. 2017).

Discussion and Conclusions

As briefly summarized here, the 2019 report documents growing evidence of laws that foster healthy development (National Academies 2019). Given the importance of broad societal-level influences on healthy MEB development, additional research on the breadth of consequential laws, especially those that may alter social determinants of health, is urgently needed. There are important opportunities for the field of prevention science to expand and fill important research gaps in the related and growing field of public health law research. Public health law research is defined as the scientific study of the relation of law and legal practices to population health (Burris et al. 2010). Advancing scientific methods, including more sophisticated theory and improved quasi-experimental designs, provide the tools for improving causal inference regarding law's effects on health and well-being (Wagenaar and Burris 2013). The application of theory and methods from prevention science to public health law research provides an important opportunity to move both fields forward, specifically in the following three key areas.

First, prevention scientists bring expertise in experimental and quasi-experimental methods that can improve the rigor of law research. The application of experimental research designs to study laws and policies that address social determinants of health is in its infancy. Prevention science can contribute by studying effects of specific policy innovations with intensive longitudinal designs, such as interrupted time-series analysis. It is equally important to study policy replications

using other quasi-experimental design approaches. Scientists do not control when and where policies are enacted and how they are implemented, and thus cannot randomly assign the legal “treatments” to some and not to others. Many research design elements that are familiar to prevention scientists, such as comparison jurisdictions and intensive longitudinal data, can be incorporated in evaluations of laws to produce accurate estimates of the size of a law’s effect with high levels of confidence that an observed effect is caused by the law (Wagenaar and Komro 2013; Shadish et al. 2002). Combining design elements produces the strongest possible evidence on whether a law caused the hypothesized effect and magnitude of that effect. In this way, the application of rigorous quasi-experimental methods will provide strong evidence to support policymaking to improve health and well-being.

Second, rarely have mechanisms of how policies affect outcomes been studied, especially through formal mediation analyses. The field of prevention science has articulated theoretical and methodological standards for the study of causal mechanisms through mediation analyses (Gottfredson et al. 2015; MacKinnon et al. 2020); Wiedermann et al. 2019). Theory, measurement of hypothesized mediators, and mediation analysis would contribute to the existing scientific basis of laws’ effects on MEB development, health, and well-being.

Third, studies related to scaling up, diffusion, implementation processes, and cost-effectiveness are limited and would advance the science around optimal approaches for scaling up laws and policies. Prevention science methods related to translation research and implementation science of evidence-based interventions (Gottfredson et al. 2015; Spoth et al. 2019) can also be applied to policy research. Mixed method studies to incorporate qualitative components can be applied to address questions of how a law was crafted, passed, or implemented (Woods 2013). Economic evaluations of laws perform the same function as evaluations of other preventive interventions—whether a law’s benefits, as measured by health outcomes or cost savings, exceed its costs (Miller and Hendrie 2013).

In conclusion, there is accumulating evidence of societal-level influences on MEB development and health (National Academies 2019), including a growing field of research that supports the centrality and importance of law for prevention. The COVID-19 pandemic’s health disparities are yet another tragic example of the urgency for scientists to provide evidence of effective laws to protect and promote health equity. For example, research is needed to examine effects of the rapidly changing landscape of laws on paid family leave, universal health care, labor law, unemployment insurance, and minimum wage laws. Prevention scientists have much to offer this emerging field with sophisticated theory, experimental and quasi-experimental research designs, advanced statistical methods for outcome and mediation analyses, and dissemination and implementation research methods. Prevention

scientists can contribute to the empirical study of laws that shape the many systems that affect healthy development, research findings that are critical for evidence-based policymaking. Rigorous science using controlled time-series natural experiments and persuading policy makers to take the resulting findings into account is of utmost importance for the protection and promotion of child and family health.

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Compliance with Ethical Standards

Conflict of Interest The author declares that she has no conflict of interest.

Ethics Approval The commentary summarizes published scientific literature and did not involve contact with human participants.

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