

Promoting the Inclusion of Population Health at the Nexus of Primary Health Care Delivery and Public Health

Advisory Committee on Interdisciplinary, Community-Based
Linkages (ACICBL)



18th Annual Report to the Secretary of Health
and Human Services and the U.S. Congress

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Health Resources & Services Administration

Advisory Committee on Interdisciplinary, Community-Based Linkages (ACICBL)

Promoting the Inclusion of Population Health at the Nexus of Primary Health Care Delivery and Public Health

Eighteenth Annual Report to the Secretary of the U.S. Department of Health and Human Services and the U.S. Congress

December 2019



The views expressed in this report are solely those of the Advisory Committee on Interdisciplinary, Community-Based Linkages, and do not represent the perspectives of the Health Resources and Services Administration nor the United States Government.

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Authority

The Advisory Committee on Interdisciplinary, Community-Based Linkages (ACICBL) provides advice and recommendations on policy and program development to the Secretary of Health and Human Services (Secretary) and the U.S. Congress concerning the activities under Title VII, Part D, of the Public Health Service Act as authorized by section 757 (42 U.S.C. 294f). The ACICBL is governed by provisions of the Federal Advisory Committee Act (FACA) of 1972 (5 U.S.C. Appendix 2), which sets forth standards for the formation and use of advisory committees.

Each year, the ACICBL selects a topic concerning a major issue within the healthcare delivery system that is relevant to the mission of the Bureau of Health Workforce (BHW) Title VII, Part D, Interdisciplinary Community-Based Linkages programs. After the ACICBL analyzes the selected topic, it develops and sends recommendations to the Secretary concerning policy and program development. In 2019, the ACICBL examined ways to enhance healthcare delivery through analyzing, applying, and disseminating public health and population data.

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This report is the culmination of the efforts of many individuals who provided their expertise to the ACICBL over the course of several meetings in Fiscal Year 2019. As noted throughout the report, experts informed the ACICBL and responded to a broad array of issues related to elements comprising population health data and current innovative practices. The members of the ACICBL express appreciation to all presenters for their time and expertise.

Special thanks to:

- James Lloyd Michener, MD, Professor of Community and Family Medicine, Duke University, for sharing his knowledge and expertise on the evolution of population health and the Practical Playbook;
- Shannon Duval, Senior Vice President of Philanthropy, CommonSpirit Health and Elizabeth Evans, PhD, Program Director for Implementation, CommonSpirit Health, for their perspective on the role of community health workers in addressing social determinants of health in primary care; and
- Ellen Harper, DNP, RN-BC, MBA, FAAN, Clinical Assistant Professor, University of Kansas School of Nursing, The University of Kansas Medical Center for her insight on how population health might be advanced using health information exchanges and informatics

Each of these presentations played a critical role in the preparation of this report. The Committee also extends their gratitude and appreciation to colleagues and fellow members who contributed to the writing of this report: Bruce E. Gould, MD, FACP; Teri Kennedy, PhD, MSW, LCSW, ACSW, FGSA, FNAP; Lisa Zaynab Killinger, DC; Jacqueline R. Wynn, MPH; James Stevens; and Robin H. Pugh-Yi, PhD.

Finally, this report has benefited from the capable assistance of federal staff from HRSA, BHW, DMD: Dr. Joan Weiss, Designated Federal Official and Senior Advisor, DMD; CAPT Paul Jung, Director, DMD; and Ms. Samantha Das, Designated Federal Official Liaison, DMD. The

ACICBL deeply appreciates the hard work and dedication of these individuals in producing this report.

Sincerely,

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Executive Summary

The Committee's recommendations focus on support for training the health workforce and other key stakeholders in population health competencies. Ability to identify and utilize population health data is critical for identifying and responding to high-priority health issues. The Committee recommends training in population health data core competency areas that are linked to improved health outcomes and to reduced health disparities. ACICBL identified core competency areas that are appropriate for support under the authority of Title VII, Part D, of the Public Health Service Act. ACICBL emphasizes that specific training approaches and content would be appropriate to trainees' roles and responsibilities. Recommendations are not intended to result in all trainees learning complex analytic skills, but for them to learn how to interpret and apply available information in ways that are appropriate for their roles as care providers, advocates, and community members.

Health care data sets, including hospital clinical records, electronic health records (EHRs), claims data, community needs and asset maps, and epidemiological databases, provide information that can be used to determine factors that contribute to health outcomes and disparities. Local sources of these data can provide specific detailed information about a community's needs and assets. This information can support the identification and/or development of evidence-based prevention and treatment practices that address known causes of health disparities and improve health outcomes at individual and community levels. To achieve these changes, it is important for practitioners to be able to do the following with respect to the populations and communities they serve:

- understand the utility and potential impact of applying information in population and public health data
- identify potential sources of data or data reports
- interpret data or data reports to identify factors that contribute to health outcomes and disparities
- apply data to identify and/or develop and implement tailored evidence-based interventions
- evaluate effectiveness of evidence-based interventions that have been implemented
- access information about evidence-based interventions from a clearinghouse and other sources, such as social media.

The Advisory Committee on Interdisciplinary Community-Based Linkages recommends prioritization and support for each of these aspects of population health data utilization in all levels of education and training for the health workforce and other stakeholders in health outcomes and equity. The aim of these recommendations is to support education and training efforts that will transform systems and practice so that population and public health data drive increased primary prevention, improved health outcomes, and improved population health status. These changes in care delivery will be designed to address the specific needs of diverse populations and communities, and ultimately result in reduced health disparities and the achievement of health equity.

Recommendations

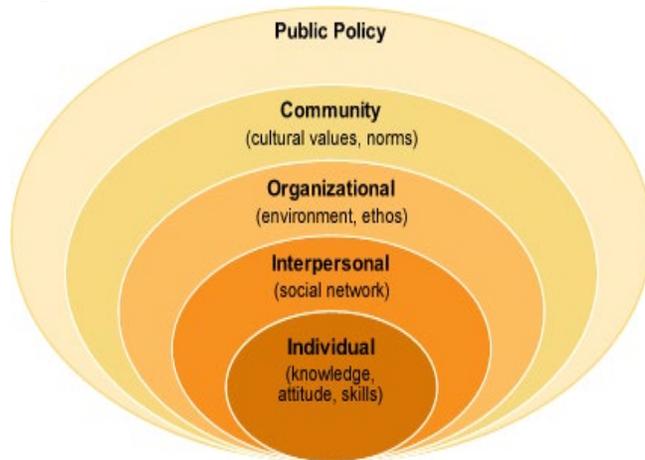
ACICBL recommends that HRSA Bureau of Health Workforce (BHW) Notices of Funding Opportunities (NOFOs) require grant recipients to:

1. Educate students, faculty, practitioners, the direct care workforce, patients, families, caregivers, and the community at large to understand the availability and utility of population and public health data in identifying risk factors for and root causes of disease and health disparities in pursuit of health equity.
2. Recruit, train, and retain the health workforce to work with the community at large to analyze population health data to identify risk factors and root causes that contribute to disease and health outcomes.
3. Identify and/or develop and implement evidence-based interventions and promising practices that address identified risk factors and root causes to improve health status and outcomes among rural, underserved and at-risk populations.
4. Evaluate and translate the effectiveness of evidence-based interventions and promising practices that address identified risk factors and root causes in order to improve health status and outcomes among rural, underserved and at-risk populations.
5. Disseminate population health knowledge, evidence-based interventions, and promising practices to improve health and eliminate disparities in rural, underserved and at-risk populations. This may be done through Health Resources and Services Administration training programs, and/or developing a clearinghouse, via social media for example. The ACICBL further recommends that agencies review their policies and ensure they promote the inclusion of population health at the nexus of primary health care delivery and public health.

Population and Public Health Data as Drivers of Targeted Health Care Training and Delivery to Increase Health Equity

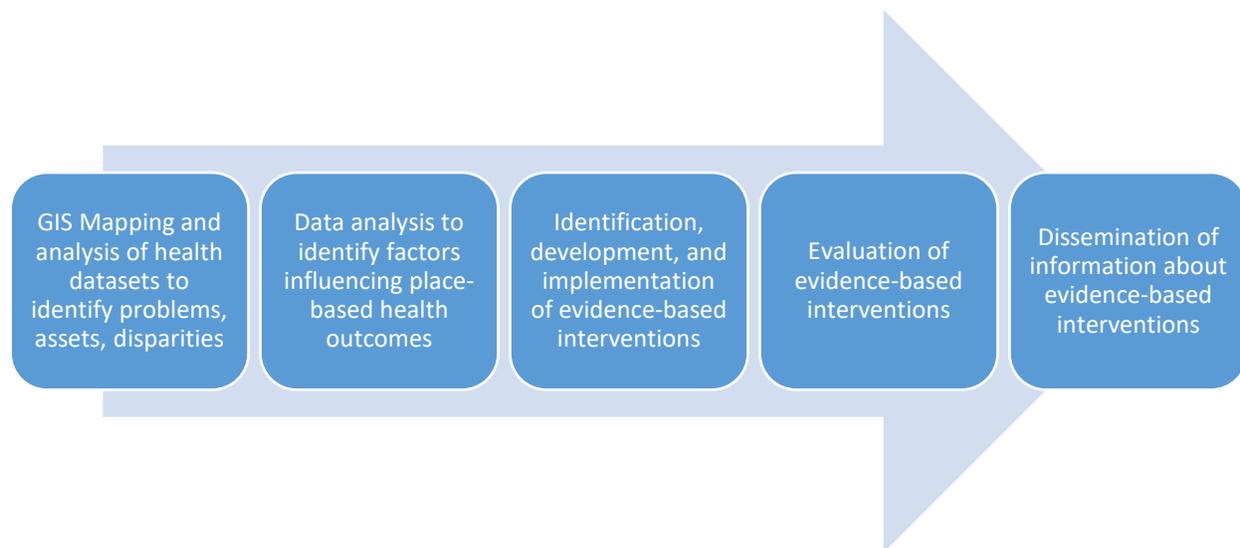
Social and economic factors, such as income, community resources, education, and discrimination account for as much as 55 percent of health outcomes (Wood & Grumbach, 2019). Examples of social determinants of health include transportation, community safety, economic stability, education, and other geographically related factors. Social, economic, and environmental disadvantages are linked to less access to healthcare, higher risk for disease, higher healthcare costs, and increased morbidity and mortality (Meyer, Yoon & Kaufmann, 2013). Ecosocial theories of epidemiology posit a multilevel framework of health and health equity, which is affected by biological, ecological, and social factors. **Figure 1** presents a basic ecosocial framework. Ecosocial theorist Krieger (2001) employs a framework that focuses on “who and what are responsible for population patterns of health... and social inequalities in health (p. 668),” with emphasis on economic, policy, and societal structures.

Figure 1. Multilevel framework of health.



Ecosocial theory informs the Committee’s recommendations, all of which aim to improve health outcomes and address health inequity through education about utilizing population and public health data, including Geographic Information Systems (GIS) data, to inform development and implementation of strategies for improving health outcomes and reducing disparities (as illustrated in **Figure 2**).

Figure 2. Logic model for utilizing health data to improve health outcomes and reduce disparities.



Need for Health Data and Geographic Information Systems (GIS) Mapping to Explain Health Outcomes and Reduce Disparities

In a discussion of health equity principles and strategies Martinez-Bianchi (2019) states, “Improving health equity requires identifying the underlying factors that cause health disparities (p.8)” and multisector partnerships invested in improving health. Population and public health data provide essential information about community health status and contextual factors that may increase risk or protect individuals and communities from illness and injury. This information provides a foundation for identifying health problems, assets, and disparities, as well as their causes and potential solutions. Lessons learned from data enhance the efficacy of clinical practice, and of multisector efforts to improve clinical health, community health advocacy, and individual decision-making. Not only researchers, but the direct healthcare workforce, policy makers, advocates, and laypersons will be equipped better to improve health outcomes with improved: awareness of population and public health data and data sources; skills in interpreting the implications of data for health status, disparities and outcomes; skills in communicating about these outcomes with diverse stakeholders; and using data to inform development strategies to improve health outcomes.

In a summary of analyses and policies regarding the relationship between clinical practice and population health, Wood & Grumbach (2019) state that a common element in recommended health care system reforms is recognition that, “(I)ndividual health is inseparable from the health of the larger community, which ultimately determines the overall health of the nation” (p.103). Orkin et al. (2017) discuss reasons for integrating population health and clinical medicine, including the Triple Aim (Berwick, 2008) of improving patient experiences and population health while reducing costs, and the necessity of reducing health disparities. Michener et al. (2015) discuss the necessity of collaboration between the clinical and public health sectors to address widespread, growing health threats. The authors present evidence-based guidance and tools to improve public health intervention management, emphasizing the importance of utilizing data, engaging community, and developing collaborative strategic approaches. Users of Michener et al.’s 2015 guidance and tools provided feedback indicating that this collaborative approach should be expanded to multisector partnerships (McGinnis, 2019).

Multisector data systems have the potential to transform health by linking individual-level electronic health records and GIS data with population and public health data, such as information about access to food, education, recreational, and health care resources (Tanner & Eckart, 2019). Such systems can support identification of factors that contribute to disparities, as illustrated by the BUILD Health Challenge framework (2017), summarized in **Figure 3**. In an article describing the potential for population health data analytics to improve care quality, Mace (2013) states, “Without robust analytics technology, the goals of accountable care and population health cannot be achieved, good intentions notwithstanding,” and, “At the heart of population health analytics is the concept of risk stratification.” Bresnick (2015) describes how “big data” analytics supports identification of high-risk patients and potential problems. Early identification allows preventive intervention, resulting in improved health outcomes, and reduced costs and disparities.

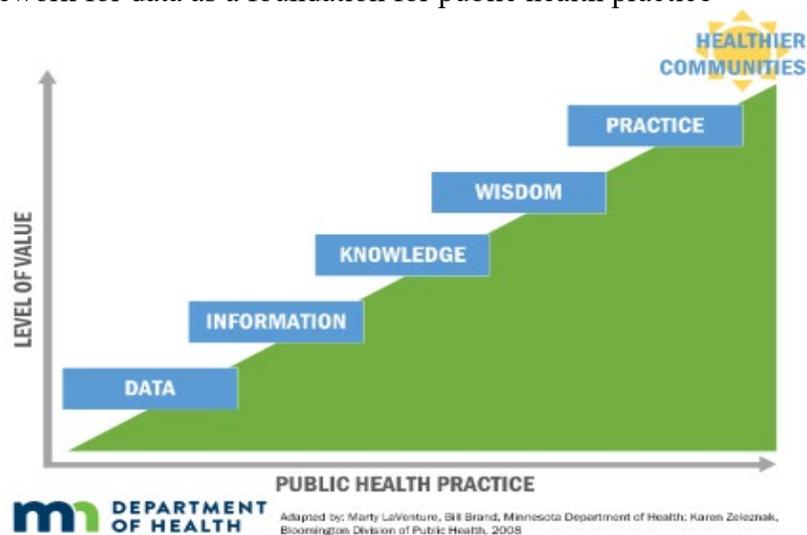
Figure 3. BUILD Health outcomes framework.



In an in-person presentation to ACICBL, Michener (2019) noted that cost is a major driver of population health. Healthcare costs in the US are higher and increasing more rapidly than in other countries, both industrialized and non-industrialized. However, US citizens are not living longer. Reasons for this can be found and addressed through utilization of population and public health data and multisector partnerships. It is crucial to listen to local perspectives and potential explanations for data patterns. Dr. Michener presented several examples of GIS mapping, population health data, and community discussion of contextual factors to identify and address disparities.

Data utilization also can support efficient and effective care coordination, and can prevent unnecessary hospital admissions. Allen, Soderberg & Laventure (2017) emphasize the importance of leveraging this potential to address community health needs and to address health disparities. The authors present a framework, presented in **Figure 4**, in which data provide a basis for discerning information and gaining knowledge, which can support wisdom in practice.

Figure 4. Framework for data as a foundation for public health practice

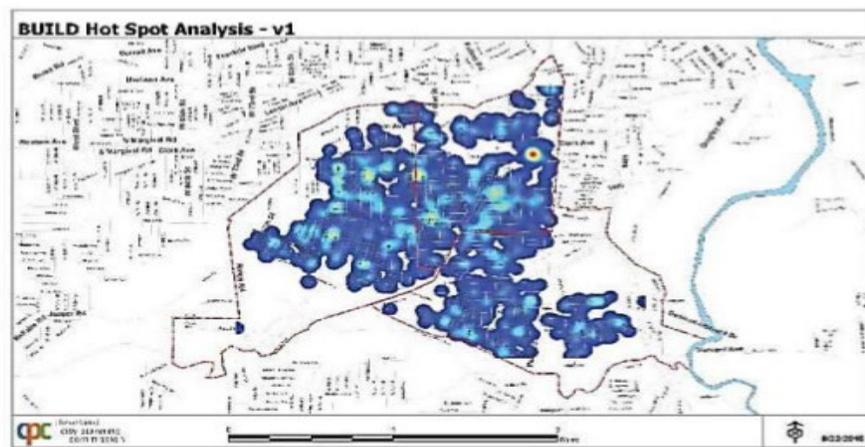


Importance of geographic data for understanding health status and disparities

GISs support integration of spatial location data, using sources such as digital topographical maps, aerial photography, and satellite imagery, with data on health behaviors and outcomes, clinical diagnoses, community resources, and other factors. This information supports identification and analysis of geographic clusters and associated community contextual factors that may influence health outcomes and disparities. This analysis supports consideration of multisector solutions aimed at changing community living conditions rather than changing only clinical care and individual behaviors (Michener & Hunter, 2019). Assessment of community risks and assets informs identification and development of interventions to address risks and leverage assets. Analysis of these data informs understanding of the structural determinants of health, and can inform models of systems-level change (Gottlieb & Fichtenberg, 2019).

An example of an approach to improving community health using population and public health and geographic data to inform clinical and community-based intervention is BUILD Health Challenge, currently operating in 19 US communities. This program, supported by a collaborative of non-profit funders, supports grantees in using clinical and community data to identify needs, factors that contribute to those needs, and to measure change. Grantees work in community partnerships to effect system-level change. Efforts include integrating transportation services, school-based nutrition and physical activity programs, and collaborating with public housing authorities to improve outcomes identified through population and public health data. A central component of BUILD Health’s strategy is to reduce health risks and increase environmental protective factors before clinical intervention is required. The model emphasizes the role of care providers in collecting data on social determinants of health and in sharing data with community partners (BUILD Health Challenge, 2017). **Figure 5** is a “hot spot” map summarizing geospatial BUILD Health used to link asthma cases to violations of housing codes in Cleveland, OH.

Figure 5. Example of “hot spot” map.



Houses that had open violations within the last 5 years. Source: Cleveland City Planning Commission

Need for educating health workforce about use of multisector data

Current priorities of the American Medical Association (AMA) Accelerating Change in Medical Education Consortium include education for students in how to use population health data. In explaining AMA's recommendation to train medical students in population health management, clinical informatics, and EHR use, CEO James L. Madara, MD stated, "Our medical schools are very good at preparing students for the basic and clinical sciences that are paramount to providing care to patients, but what is largely missing is how to deliver that care in a complex health system" (Bresnick, 2016). The American College of Physicians recommends that, "Social determinants of health and the underlying individual, community, and systemic issues related to health inequities be integrated into medical education at all levels. Health care professionals should be knowledgeable about screening and identifying social determinants of health and approaches to treating patients whose health is affected by social determinants throughout their training and medical career" (Daniel, Bornstein & Kane, 2019). In order for students to learn, faculty must be knowledgeable and able to teach them why and how to use public and population health data.

In an in-person presentation to ACICBL Harper (2019) noted that the US health care system is actually more of a sick care system, designed to treat, but not prevent disease. Most health care systems have access to massive amounts of data but struggle to use it meaningfully. They have invested heavily in clinical intelligence and analytics to support key business decisions and processes. More complex data analysis leads to more utility and competitive advantage. Health information tools range from real-time alerts at point of care to stochastic optimization programming that supports probabilistic estimates of unknown variable values in order to support decision-making. Tools may be descriptive, predictive, or prescriptive. They support analyzing data to develop actionable clinical intelligence. Applying Allen, Soderberg & Laventure's model presented in Figure 4: Raw data provide information such as A1C test results. Knowledge is required to understand that a level greater than 6.5 is an indication of diabetes. Insight is required to understand that two such results indicate a diabetes diagnosis and need for treatment. Wisdom is required to know how to treat the disease and evaluate treatment outcomes. Technology does not replace judgment, but provides tools to assist clinicians. Technology developers must focus on how to support clinical wisdom with actionable data.

Using data to understand causes, risks, factors associated with resiliency, and how they interact to affect health outcomes requires competency in identifying relevant data sources and interpreting the implications of data. In a call for population health competency among clinicians, Kaprielian et al. (2013) cite a 2012 Institute of Medicine report as one of several calls for incorporating population health skills in health professionals' training. Mattson and Remley (2019) identify the ability to think critically about data, and about collection and analysis methodologies, as a core population health competency. The Public Health Foundation identified core competencies in population health, stating that these can strengthen the connection between public health and healthcare (Public Health Foundation, 2019). Core competencies include skills in data collection, analysis, and interpretation. The Public Health Foundation recommends a focus on competencies most relevant to one's job. Kaprielian et al. (2013) offer a framework for educating health professionals. The authors identify the following core outcomes: ability to use qualitative and quantitative data to assess population health status, ability to evaluate critically peer-reviewed literature and its implications, ability to apply quality improvement models, and ability to assess intervention processes and outcomes. The authors also describe foundational, intermediate, and advanced levels for each of these competencies.

The Lancet Commission identified a critical need for clinical and administrative programs to train students how to integrate population health competencies into clinical practice (Orkin et al., 2017).

Need for educating laypersons about use of multisector data

Identifying community health needs, priorities, and efforts to improve outcomes does not require professional affiliation. Community health advocacy efforts include laypersons identifying and addressing community needs through policy advocacy, collaboration with clinical and research professionals, and community efforts to leverage and allocate resources. Examples include advocacy to create safe and accessible parks and recreation space (Dohm, McLaughlin & Wooten, 2015), substance abuse prevention (Spoth et al., 2017), and domestic violence reduction (National Resource Center on Domestic Violence, 2012). These efforts benefit from awareness and understanding of population and public health data.

It is important for laypersons as well as health care providers to be aware of the utility and applications of population and public health data. In a meta-analysis of 131 studies, O'Mara-Eves et al. (2015) found that community engagement with planning, designing, governance, and delivery of services was associated with significant improvement in health behavior outcomes, self-efficacy, and social support among disadvantaged communities. Results indicated that peers and community members were especially effective at improving health behaviors and that community engagement is especially important for socioeconomically disadvantaged communities. In a review of literature on layperson roles in public health, South et al. (2010) found that community health workers are an important resource for providing education and sharing information with vulnerable or hard-to-reach populations. The authors cite needs assessment as a key role for community health workers, to inform service planning and development. Data provide critical evidence of community-specific needs.

In a review of the history of public health surveillance, Choi (2012) identifies five essential functions of a public health system: population health assessment, health surveillance, health promotion, disease and injury prevention, and health protection. The author emphasizes the importance of the general public's understanding health risks, healthy activities, and available treatment and services through channels such as news media and digital tools. He observes a need for accessible, culturally appropriate approaches to disseminating this information to lay audiences. Community health workers are an important resource for addressing this need. The Centers for Disease Control and Prevention (2015) cites multiple studies demonstrating the effectiveness of these frontline public health workers in improving community health outcomes. CDC's policy brief credits community health workers' ties to community networks and understanding of community social context as critical assets. CDC recommends deployment of community health workers to high-risk communities to address health disparities and to improve health outcomes. Community health worker roles include outreach, education, needs assessment, and facilitating community-clinical linkages. In addition, community health workers often recruit research participants and collect health data from community members. Training community health workers regarding the availability and utility of population and public health data supports them in fulfilling their professional responsibilities.

The Committee recognizes that it is unrealistic to recommend that non-researcher stakeholders learn to conduct statistical data analysis. The goal is for these stakeholders, including the general public, to learn about the availability and implications of population and public health data in order to utilize appropriate resources, such as information summarized in media and policy reports, and to collaborate effectively in determining community health needs and how to address them. The National Cancer Institute's *Making Data Talk* (Nelson, Hesse & Croyle, 2009) presents a synthesis of research on effective presentation of population and public health data to policy makers, the press, and the general public. To be effective, training and education approaches must demonstrate how data are useful and relevant for target audiences, and must clearly communicate which actions the audience should take in response, such as avoiding foods distributed by sites affected by salmonella outbreaks, determining why asthma is disproportionately prevalent in a particular geographic location, or how excise taxes on sugar-sweetened beverages link to levels of consumption and rates of diabetes. Effective education approaches will teach students and trainees at all levels why population and public health data are relevant to them, and how they can apply these data to improve health outcomes and reduce disparities.

Tailoring training for target audiences

Training approaches should be tailored to address varying familiarity with data, the technology used to collect, store, and analyze data, and the implications for public health. Millennials (Americans born between 1981 and 1996) tend to adopt and use technology earlier than older generations, and to be more aware of the societal implications of big data and technology than older generations (Jiang, 2018). Therefore, faculty may be more in need of training in these areas than students and early career trainees. However, research has shown that lower income, African American, and Latinx¹ young people are affected by a “digital divide” in technology access (Cohen et al., 2018). Training programs should not assume technical proficiency among all younger students.

¹ “Latinx” is a gender neutral term for people of Latin American heritage. (Merriam-Webster dictionary; Coleman and Mancini, 2019).

Utilizing Data to Identify Risk and Disparities

Reducing disease and supporting optimal health status requires knowing which factors affect risk and resilience, and identifying disparities in outcomes and experiences. Knowledge of disparities and their magnitudes requires data and the ability to interpret the implications of those data. DeRose, Gresenz and Ringel (2011) describe an evolution in understanding health disparities from emphasizing individual-level factors to understanding the roles of geographic location, community, policy, and public health system factors. In their brief on using data to improve clinical care quality and reduce health disparities, DeMeester and Mahadevan (2014) state, “Closely examining performance data stratified by race, ethnicity, or language is the most reliable way to reveal the type and magnitude of a disparity and thus either verify ‘hunches’ or redirect the organization’s focus.” In a summary of efforts to transform health outcomes and systems through data sharing, Tanner and Eckart (2019) state that sharing data is fundamental to multisector approaches.

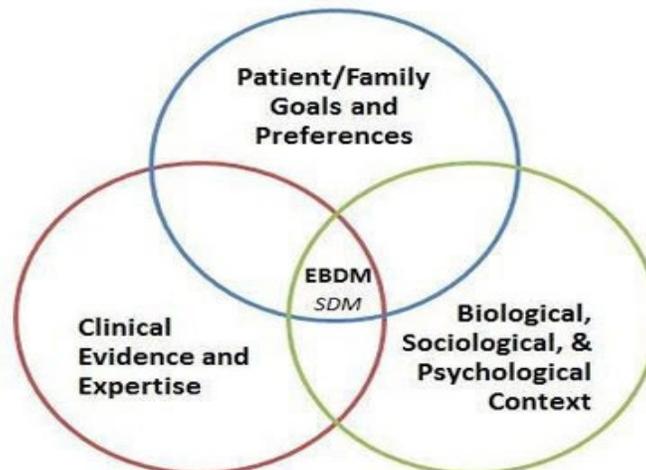
Examples of using data for this purpose include:

- Song et al.’s 2011 study in which the authors linked American Community Survey with National HIV Surveillance System data then conducted correlational analyses to identify geographic and socioeconomic correlates of HIV/AIDS
- The Baltimore B’FRIEND initiative to reduce falls among older adults by implementing a falls surveillance system to collect data on falls and potential risk factors, then working with community stakeholders to reduce risks. For example, data identified a neighborhood area with a disproportionately high number of falls, Community discussions revealed that this was due to a steep, high hill between housing for older adults and the nearest grocery store. The community used this information to develop solutions that would reduce falls (Phelan-Emrick et al., 2019).
- Razavian et al.’s (2015) identification of risk factors for Type 2 diabetes through analysis of merged administrative claims, pharmacy data, healthcare utilization data, and laboratory results from 4.1 million individual records.
- Pediatrician Mona Hanna-Attisha’s geospatial analysis of electronic health record data which revealed changes in the blood lead levels in children living in disadvantaged neighborhoods following a change in drinking water source in Flint, Michigan (Mattson & Remley, 2019).

Another example of clinicians using population and public health and geographic data to identify and respond to community needs is application of the California Healthy Places Index. The index provides detailed data on local conditions and life expectancy. It is designed for use by clinicians, administrators, researchers, and policy makers to assess needs, determine priorities, and promote healthier conditions (Delaney et al., 2018). Another example of healthcare providers using population and public health data in practice is Princeton Health Affiliated Physicians’ integration of a public health software tool into EHRs. A process evaluation found that the tool facilitated patient risk assessment and management of chronic disease and behavioral health, and supported preventive intervention to improve outcomes among high-risk patients (Fisch, 2017).

Learning Networks provide an example of clinicians, researchers, patients, families, and caregivers collaborating to improve health outcomes. Learning Networks focus on a high-impact health or safety issue, engage patients, caregivers, health care providers, administrators and researchers to set measurable targets, collect and analyze data, and test small-scale changes in outcomes quickly (Lannon & Peterson, 2013). The American Board of Pediatrics has supported the development of Learning Networks as a means to improve public health at scale (Lannon & Pickles, 2018). Learning Networks have led to a greater than 40 percent reduction in mortality among infants with hypoplastic left heart syndrome (Anderson et al., 2019), improved remission rates among children with Crohn’s disease and ulcerative colitis by 33 percent (Crandall et al., 2012), and reduced serious patient safety events in pediatric hospitals by 50 percent (Fisher, 2016). A central premise of Learning Networks is that change requires collaboration with patients and families to share information, data, and lessons learned. **Figure 6** illustrates the Learning Networks model for evidence-based decision making (EBDM) and shared decision making (SDM).

Figure 6. Learning Networks model for evidence-based decision making (EBDM) and shared decision making (SDM).



In an in-person presentation to ACICBL Duval and Evans (2019) presented examples of CommonSpirit Health’s implementing universal screening for social determinants of health in its clinics, constructing online databases of community resources, and working with community collaborative networks to identify and address local health needs. The presenters emphasized the importance of community engagement, development and utilization of population data, and the role of community health workers in facilitating communication between clinicians, social service providers, and laypersons.

Utilizing Data to Identify and Develop Evidence-based Interventions

In their summary of reasons for communities to use population and public data to drive health improvement, Tanner and Eckart (2019) state the crucial role of these data in identifying social determinants of health, community needs, and community-level adverse conditions. Wang et al. (2019) cite the importance of local public health data, at the city and tract levels to identify emerging local health issues and effectively plan to improve community health.

Zhang et al. (2014) and Wang et al. (2017) conducted influential studies that supported development of small area estimates of population health data and understanding of their potential to inform policy and practice. Zhang et al. (2014) developed a multilevel regression approach using Behavioral Risk Factor Surveillance System (BRFSS) and 2010 US Census data to develop small area estimates of prevalence and correlates of chronic obstructive pulmonary disorder. The authors state that the small area estimates allow analysis of contextual and demographic factors at the local level. Analysis results provide detailed and nuanced information to policy makers and administrators, who can apply results to decisions about community resources and planning. The authors recommend applying the approach to additional public health issues. Zhang et al. (2015) validated this approach using Missouri county-level data, American Community Survey data, and BRFSS data and comparing estimates to direct measures.

Wang et al. (2017) used the small area estimates approach developed by Zhang et al. to develop high quality small area estimates for the 500 Cities project. Until 2016, when the Centers for Disease Control and Prevention and the Robert Wood Johnson Foundation jointly launched the 500 Cities project, large-scale local health and health-related data were not available. The 500 Cities project is a public database that includes measures of five key unhealthy behaviors, 13 priority health outcomes, and nine high-impact prevention services. It supports stratified small area estimates of risks and progress. Its purpose is to support development and implementation of targeted, evidence-based interventions, identify emerging problems, and identify and monitor progress toward targeted outcomes. In a review of evidence-based behavioral health interventions Cutler (2004) noted that interventions can target individuals, communities, or national populations. The author states that it is difficult to change individual behaviors without addressing environmental context. Interventions include information campaigns, clinical services, and policy change. For example, the response to the Flint, Michigan water crisis was a declaration of a public health emergency and Environmental Protection Agency action (Hanna-Attisha et al., 2016), an evidence-based targeted intervention.

Geographic analysis can be used to identify and track resources as well as health status. Noor et al. (2009) tracked insecticide-treated net (ITN) coverage among children younger than five years in 40 malaria-endemic African countries from 2000 through 2007. The authors assessed risk for malaria and economic risk, and mapped need at the state, province, or governorate level, then compared these estimates to national estimates of needs. Findings demonstrated that national estimates of ITN coverage masked unmet needs in low-income, high-risk communities. The authors concluded that local public health data were essential for identifying needs and disparities, and for developing more effective targeted plans for increasing ITN coverage where need was greatest.

In an in-person presentation to ACICBL Tierney (2019) described Southcentral Foundation health system's service model approach for American Indian and Alaska Native communities in the Anchorage, Alaska area. The model emphasizes patient engagement, shared responsibility, and relationship-based care. Care delivery has changed in response to community input regarding how care can be more efficient and accessible. Since implementation in 2000, emergency department visits have decreased 40 percent, hospital stays have decreased 36 percent, and many Healthcare Effectiveness Data and Information System (HEDIS) quality measures have exceeded the 75th percentile.

Importance of Evaluating Interventions

In their article describing strategies for evaluation of policies and practices to reduce health disparities, Dye et al. (2019) state, "Despite the importance of evaluating health disparities research to produce high-quality data that can guide decision-making, it is not yet a customary practice" (p. 34). The authors emphasize the importance of applying evaluation research to identify and test mechanisms for addressing health disparities. They describe strategies presented at the National Institute on Minority Health and Health Disparities Metrics and Measures Visioning Workshop (April 2016) for the formative, design, and summative phases of evaluation. The authors state that sociocultural context and community needs should inform decisions throughout the evaluation process. Formative evaluation includes needs assessment and process evaluation. Needs assessments should identify community strengths, social context, and sociocultural constructs. Design decisions should consider the importance of qualitative data in providing cultural insight and identifying mediating factors. Process evaluations should document degree to which interventions are implemented as planned, and the lessons learned from implementation. Summative evaluations should be designed for accountability to community stakeholders. This approach to evaluation supports early identification of disparities and risk factors, including geographic clusters of disparate outcomes and risk, and development of evidence-based approaches to address risk and to reduce disparities.

Jongen, McCalman and Bainbridge (2017) cite the Ottawa Charter for Health Promotion, "(H)ealth promotion strategies and programmes should be adapted to the local needs and possibilities ... and take into account differing social, cultural and economic systems." The authors state, "To inform the implementation and evaluation of health promotion programs and services to improve cultural competency, research must assess both intervention strategies and intervention outcomes (p.1)." In a systematic review of results of 64 cultural competency interventions, the authors identified three strategic foci: community, culture, and language. While results generally indicated that cultural competency interventions may improve communication with patients and health outcomes, the authors found study methodological rigor was often lacking. The authors stress the importance of more rigorous evaluation for developing effective, culturally appropriate interventions.

O'Connor et al. (2011) describe development of health education and occupational safety training programs for underserved communities. The authors emphasize the importance of evaluation to assess training effectiveness. They cite qualitative data collection as an important method for identifying and addressing cultural gaps. The authors provide case study examples of forming community partnerships to identify needs, to develop culturally competent interventions to address those needs, and to test intervention outcomes. They provide the example of JUSTA-

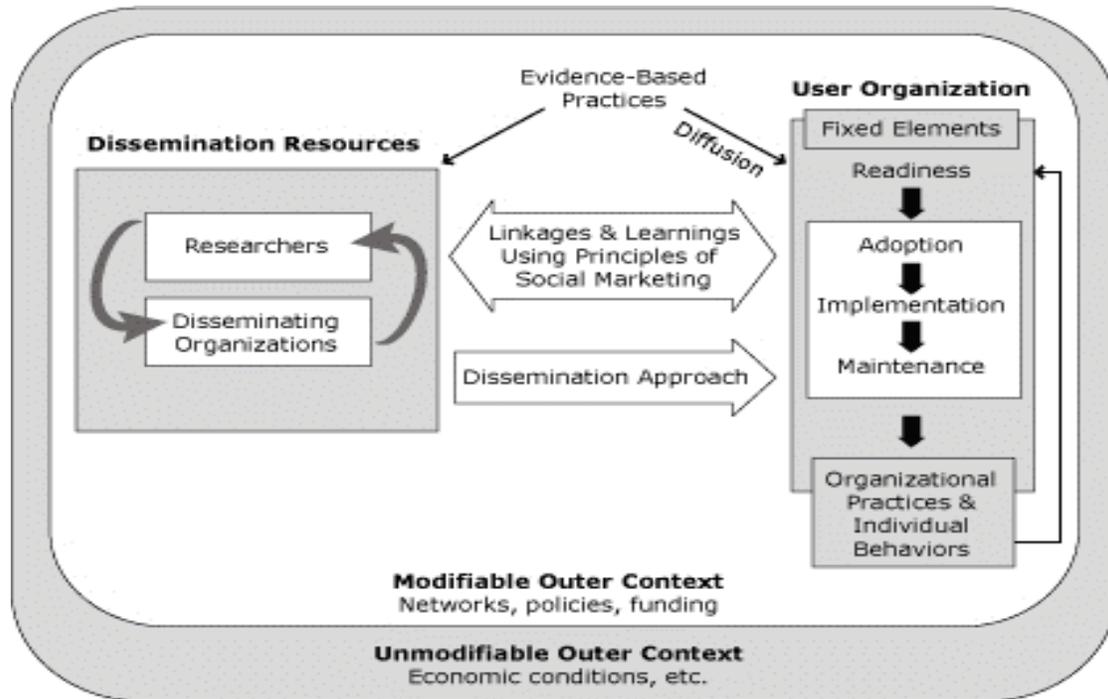
Justice and Health for Poultry Workers, which was developed to promote health and safety among non-unionized Latinx immigrant workers at North Carolina poultry processing plants. The authors collected quantitative injury and illness population data, and qualitative data on perceptions and priorities from the participating community. These data informed development of tailored training about addressing priority health issues and about participants' rights in the workplace. An outcomes evaluation demonstrated increases in knowledge and in targeted health behaviors. In response to evaluation results, developers expanded and disseminated the intervention.

Fry et al. (2018) discuss the importance of evaluating community-based health improvement programs. The authors observe that program staff frequently lack competency in design planning and, as a result, implement designs unlikely to demonstrate intervention effects on targeted outcomes. This is especially true when targeted outcomes are difficult to change and when the population served is vulnerable. The authors call for funders to support more training in evaluation. In addition, they cite the value of local population data for indicating community health status. The authors present an example of using local population data to create a control group for evaluations initially designed for pre- and post-treatment comparison only. Results demonstrated that interventions often are implemented where need is greater, so that target communities are at higher risk than others that may be used as comparison groups. Evaluation designs that do not account for this are likely to underestimate effectiveness of interventions. The risk factors affecting these communities often include major socioeconomic forces that affect health to a degree difficult for one health improvement program to overcome. Population health data help to identify these factors, to quantify their effects, to inform interpretation of program effects in the context of community vulnerability, and to indicate the types of intervention required to achieve significant health improvement in vulnerable communities, such as policy change.

Disseminating Information Regarding Evidence-based Interventions

Harris et al. (2012) cite calls from the Centers for Disease Control and Prevention and National Institutes for Health for improved dissemination of evidence-based practices to respond to the need for wider adoption. The authors propose a framework in which researchers and a disseminating organization collaboratively apply social marketing principles to reach potential users. The authors identify disseminating organizations as a critical link between researchers who create knowledge about evidence-based practices and users who implement those practices. They emphasize the importance of a single organization accepting dissemination responsibilities. The authors point out that it is important for researchers to focus on research rather than dissemination, and for disseminating organizations to be responsible for developing systems that support the maximization of the reach to target audiences, and adaptation. Social marketing principles require considering users' needs and capacity when promoting practices. Harris et al.'s framework is illustrated in **Figure 7**.

Figure 7. Harris et al. (2012)'s health promotion dissemination framework.



In a systematic review of 56 studies about the effects of governmental structures and mechanisms on use of health evidence, Liverani, Hawkins and Parkhurst (2013) found that using evidence to make health policy decisions was more likely when an organization had been formally mandated to provide such evidence.

Bennett and Jessani (2011) introduce their knowledge translation toolkit with discussion of the importance of translating evidence to policy. The authors state that translation requires transmission of relevant information to audiences who can benefit, in language and format that inform, guide, and motivate. The toolkit cites clearinghouses as efficient and effective vehicles for storing, appraising, retrieving, disseminating knowledge. The authors identify the following core activities for clearinghouses: determining the type of knowledge to be captured, scanning the environment to identify existing knowledge, collecting all relevant knowledge, creating systems to support search and access. Dissemination systems also may support synthesis of research findings or rapid responses to user needs for information or expert opinions.

Social media are another outlet with potential to disseminate information about health and disparities to wide and diverse audiences. Wakefield et al. (2010) reviewed research on mass media campaigns and found that they are often effective at promoting healthy decisions, especially when linked to interventions and services. Smith and Denali (2014) summarized research demonstrating the utility of social media for needs assessments and disseminating health information. The authors present evidence that social media are accessed frequently, are cost-effective, and are associated with increased targeted healthy behaviors. Social media support targeted messaging and allow users to share information.

Summary

Population health data are a critical resource for improving health outcomes and for reducing health disparities. These data provide the information needed to identify and prioritize health issues, to understand factors that affect health outcomes, and to develop culturally competent, effective approaches to improve health outcomes at the individual, community, and population levels. Therefore, ACICBL's recommendations focus on support for training in key areas of population health competencies and for dissemination of information about population health data and lessons learned from them.

Identification of social determinants of health is an important application of population health data. High-quality, patient-centered care requires an understanding of the patients' environmental context and how it affects health. This requires competency in identifying data sources, data interpretation, and applying results to practice. An important application of competency in interpreting population and public health data is the ability to identify factors that contribute to health outcomes. Population and public health data can be used to identify community health needs, disparities, root causes, and correlates. Analysis of these results produces evidence about the types of interventions that will improve health outcomes.

Additional training and education opportunities in population and public health data interpretation and application competencies will increase health care and other service providers' ability to utilize information beyond what is learned in their direct practice in order to provide person-centered care and to affect health outcomes at the individual, neighborhood, community, and population levels. These competencies will contribute to advocates', policy makers', and the general public's ability to identify community needs and to develop strategies for addressing those needs.

Intervention evaluation is essential for determining whether a promising practice is effective, culturally competent, and responsive to the specific needs of the rural and underserved communities intended to benefit from specific implementation efforts. Evaluation of these practices will indicate their effectiveness, efficacy, and efficiency. Research and evaluation results that indicate factors that contribute to health outcomes and disparities, as well as which approaches to prevention and treatment address root causes and contributing factors must be made available to practitioners and other stakeholders in order to maximize impact and reach. A clearinghouse with a formal mandate, positioned to work collaboratively with researchers, and with the capacity to use social marketing strategy to reach a broad audience of practitioners and policy makers would be effective and efficient dissemination mechanisms. Social media and other information campaigns are other potentially effective dissemination mechanisms for ensuring all stakeholders have access to the most recent information about health issues and how to address them.

Based on recent research evidence and calls from experts in the field, the ACICBL recommends support for training in core areas that support utilization of population and public health data to develop and implement evidence-based approaches to improving health outcomes, reducing health disparities, and achieving health equity through the following recommendations:

Recommendation 1

The ACICBL recommends that HRSA Bureau of Health Workforce (BHW) Notices of Funding Opportunities (NOFOs) require grant recipients to educate students, faculty, practitioners, the direct care workforce, patients, families, caregivers, and the community at large to understand the availability and utility of population and public health data in identifying risk factors for and root causes of disease and health disparities in pursuit of health equity.

Rationale: Population and public health data provide information that can be used to identify granular location- and population-specific risks and assets, including social determinants and cultural factors that affect community health. These data can help to identify factors that contribute to disparities affecting communities, to identify community needs and assets, delineate root causes of health disparities, inform prioritization of health needs, and inform identification and development of strategies to address those needs. It is critical for the direct care workforce, patients, families, caregivers, and the general public to understand the potential of utilizing these data to inform proactive strategies to mitigate risk and reduce disparities, to improve practice, and optimize health status.

Recommendation 2

The ACICBL recommends that HRSA Bureau of Health Workforce (BHW) Notices of Funding Opportunities (NOFOs) require grant recipients to recruit, train, and retain the health workforce to work with the community at large to analyze population health data to identify risk factors and root causes that contribute to disease and health outcomes.

Rationale: Understanding factors that contribute to disease and health is an important component of providing person-centered care, and is critical for identifying and addressing health disparities. Ability to interpret population and public health data is essential for identifying and responding to root causes and other contributing factors.

Recommendation 3

The ACICBL recommends that HRSA Bureau of Health Workforce (BHW) Notices of Funding Opportunities (NOFOs) require grant recipients to identify and/or develop and implement evidence-based interventions and promising practices that address identified risk factors and root causes to improve health status and outcomes among rural, underserved and at-risk populations.

Rationale: Results of population and public health data analysis will indicate the presence and nature of health disparities, and the factors (root causes) that affect health outcomes in underserved and remote populations and communities. This evidence should inform development of interventions to address disparities and to improve health status and outcomes among targeted populations and communities.

Recommendation 4

The ACICBL recommends that HRSA Bureau of Health Workforce (BHW) Notices of Funding Opportunities (NOFOs) require grant recipients to evaluate and translate the effectiveness of evidence-based interventions and promising practices that address identified risk factors and root causes in order to improve health status and outcomes among rural, underserved and at-risk populations.

Rationale: While population and public health data can identify risk and resilience factors to inform development of promising practices, the effectiveness of promising practices for underserved and rural communities can be established only through evaluation.

Recommendation 5

The ACICBL recommends that HRSA Bureau of Health Workforce (BHW) Notices of Funding Opportunities (NOFOs) require grant recipients to disseminate population health knowledge, evidence-based interventions, and promising practices to improve health and eliminate disparities in rural, underserved and at-risk populations. This may be done through Health Resources and Services Administration training programs, and/or developing a clearinghouse, via social media for example. The ACICBL further recommends that agencies review their policies and ensure they promote the inclusion of population health at the nexus of primary health care delivery and public health.

Rationale: Interventions informed by geographic and population and public health data have the potential to improve health outcomes and reduce disparities affecting rural and underserved communities. Information about evidence-based promising and effective practices is an important resource for planning and developing interventions to address community needs. A clearinghouse and campaigns to disseminate this information will increase capacity to adopt targeted evidence-based practices. Furthermore, as organizational policy environments often act as a barrier to innovation, it is imperative that agencies review and revise existing policies, and create new policies to facilitate implementation of these changes.

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