

Evidence Based Public Health Practice: Brief Introduction

"Evidence-based" is a term in popular use in public health and medicine today, and with good reason - evidence-based interventions should provide the best outcomes for patients and populations. Evidence-based approaches have been adopted in medicine to improve the care for individual patients. The practice of evidence-based public health (EBPH) is an integration of science-based interventions with community preferences for improving population health [1]. Evidence-based public health utilizes the current best available evidence to make decisions in the public health service, and also to develop action plans, public health programs, and policies for addressing public health issues. This is starting to have an impact on improving public health services. Evidence-based public health is defined as the development, implementation, and evaluation of effective programs and policies in public health through application of principles of scientific reasoning, including systematic uses of data and information systems, and appropriate use of behavioral science theory and program planning models [2].

Despite the many accomplishments of public health, a greater attention to evidence-based approaches is warranted. There is a growing demand to use scientific reasoning approaches to support informed

decisions concerning public health issues and policy development, and to provide rational and effective public health programs in society. Increased focus on evidence based public health has many direct and indirect benefits including access to more and higher quality information on what works, a higherlikelihood of successful programs and policies being implemented, a greater workforce productivity and more efficient use of public and private resources [3].

The concept of EBPH evolved at the same time as discourse on evidence-based practice in the disciplines of medicine, nursing, psychology, and social work. Scholars in these related fields seem to agree that the evidence-based decision-making process integrates 1) best available research evidence, 2) practitioner expertise and other available resources, and 3) the characteristics, needs, values, and preferences of those who will be affected by the intervention (Figure) (4-7). The increasing technical sophistication of public health problems and approaches emphasizes the importance for an evidence-based approach to developing policy and interventions. Public health practitioners should always seek scientific evidence while selecting and implementing programs, developing policies and evaluating progress [8, 9].

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Fig 1: Domains that influence evidence based decision making. Source: Satterfield JM et al (4).

Key components of EBPH include making decisions on the basis of the best available scientific evidence, using data and information systems systematically, applying program-planning frameworks, engaging the community in decision making, conducting sound evaluation, and disseminating what is learned [3]. First, we need scientific information on the programs and policies that are most likely to be effective in promoting health (i.e., undertake evaluation research to generate sound evidence) [10, 2, 11, 12]. Second, to translate science to practice, we need to marry information on evidence-based interventions from the peer-reviewed literature with the realities of a specific real-world environment [2, 13, 14]. To do so, we need to better define processes that lead to evidence-based decision making. Finally, wide-scale dissemination of interventions of proven effectiveness must occur more consistently at state and local levels [15]. Public health decision-makers are often overwhelmed with large quantities of data, evidence, reviews and summaries. As the volume of information increases, the need for trusted sources of synthesis becomes greater. Not all evidence is judged to be of equal value, that is, there are hierarchies of research design that are evaluated to have different strengths, different levels of value in the decision making process. Public health evidence often derives from cross-sectional studies and quasi-experimental studies, rather than the so-called "gold standard" of randomized controlled trials often used in clinical medicine. Study designs in public health sometimes lack a comparison group, and the interpretation of study results may have to account for

multiple caveats. Public health interventions are seldom a single intervention and often involve large-scale environmental or policy changes that address the needs and balance the preferences of large, often diverse, groups of people.[16]

Table 1 Comparison of the type of the scientific evidence

Characteristics	Type One	Type Two	Type Three
Typical data/Relationship	Size and strength of preventable risk-disease relationship (measure of burden, etiologic research)	Relative effectiveness of public intervention	Information on the effectiveness of adaptation and translation of an effective intervention
Common setting	Clinic or controlled community setting	Socially intact groups or community wide	Socially intact group or community wide
Example	Smoking causes lung cancer	Price increase with targeted media campaign reduces smoking rate	Understanding the political challenges of price increases or targeting media message to particular audience segments
Quantity	More	Less	Less
Action	Something should be done	This particular intervention should be implemented	How an intervention should be implemented

Type 1 evidence defines the causes of diseases and the magnitude, severity, and preventability of risk factors and diseases. It suggests that "something should be done" about a particular disease or risk factor. Type 2 evidence describes the relative impact of specific interventions that do or do not improve health, adding "specifically this should be done" [2]. Type 3 evidence (of which we have the least) shows how and under which contextual conditions interventions were implemented and how they were received, thus informing "how something should be done" [17]. Studies to date have tended to overemphasize internal validity (e.g., well-controlled efficacy trials) while giving sparse attention to external validity (e.g., the translation of science to the various circumstances of practice [18, 19].

Using knowledge to improve the effectiveness and efficiency of public health policy requires strengthening the links between synthesis, generation and translation of that knowledge. We need to understand the strengths and limitations of the knowledge we have, identify and fill gaps in the time available, and work in partnerships that comprise users and generators across the entire relevant sector. [20,21]

The key components of evidence-based public health include making decisions on the basis of the best available, peer-reviewed evidence, using data and information systems systematically, applying program-planning frameworks, engaging the community in decision making, conducting sound evaluation, and disseminating what is learned.

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