

WORKING DRAFT

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*Introduction to the
Syndemics Prevention Network*

SYNDEMIC |syn·dem·ic| (noun): *two or more afflictions, interacting synergistically, contributing to excess burden of disease in a population.* Related concepts include linked epidemics, interacting epidemics, connected epidemics, co-occurring epidemics, comorbidities, and clusters of health-related crises.

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About the Network

The Syndemics Prevention Network is devoted to finding new ways of improving community health and achieving health equity. Throughout the sphere of public health and beyond, network members are working together to explore the meaning of a word that is not yet in the dictionary. The term “syndemic” refers to the phenomenon of linked epidemics. Scholars and practitioners have long observed interactions among diseases, but it wasn’t until the early 1990s that anthropologist Merrill Singer suggested that empirical connections among epidemics might signify the existence of a higher-order phenomenon—a syndemic (Singer 1994; 1996; see also “What Is a Syndemic?”).

The prospect of using a syndemic orientation to find new prevention opportunities is energizing people throughout the public health workforce. A coordinated effort, led by the Centers for Disease Control and Prevention (CDC), is now under way to explore the implications of syndemics for altering public health science and action. Representatives from partner organizations are contributing time and expertise, and a widening circle of community leaders, researchers, health officials, and others is forming to answer some basic questions about syndemics:

- What is a syndemic?
- What principles characterize a syndemic orientation?
- Under what conditions is it appropriate (or inappropriate) to use a syndemic orientation?
- What advantages and limitations are associated with a syndemic orientation?
- What procedures are available for planning and evaluating initiatives to prevent syndemics?
- How can we prepare the public and the public health workforce to adopt a syndemic orientation?

Although only a few people are working on the specific task of defining a syndemic orientation per se, many are pursuing areas of related interest (see “Areas for Exploration”). The Syndemics Prevention Network exists to connect the broadest possible range of collaborators, promoting information exchange and mutual learning among those exploring new ways of creating (or restoring) the conditions that support safer, healthier people. Through scholarship, service learning, networking, and other activities, those involved are discovering how a syndemic orientation fosters essential partnerships and opens new pathways for fulfilling the mission of public health.

Network membership is open to anyone with interest. General information is available to everyone, but only registered members can access work in progress, collaboration tools, and related resources. A brief registration form is available at <http://www.cdc.gov/syndemics>.

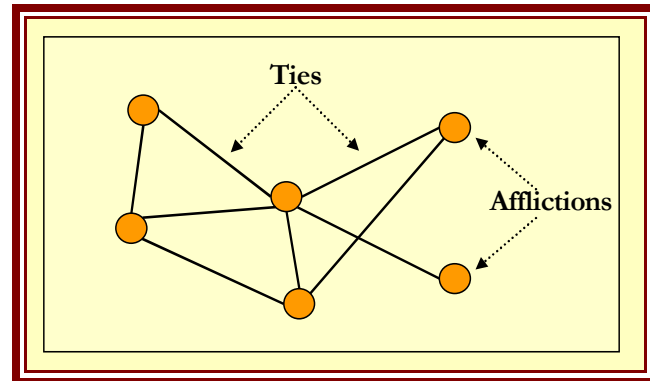
What Is a Syndemic?

"Syndemic" is a term invented to describe a set of linked health problems. The word does not appear in any dictionary, so a widely accepted definition does not exist. The following working definition conveys the meaning usually understood by those who have studied the concept:

A syndemic is two or more afflictions, interacting synergistically, contributing to excess burden of disease in a population.

Syndemics occur when health-related problems cluster by person, place, or time. The problems-along with the reasons for their clustering-define a syndemic and differentiate one from another (although as in most network structures they may have nested or overlapping relationships) (Figure 1). To prevent a syndemic, one must prevent or control not only each affliction but also the forces that tie those afflictions together.

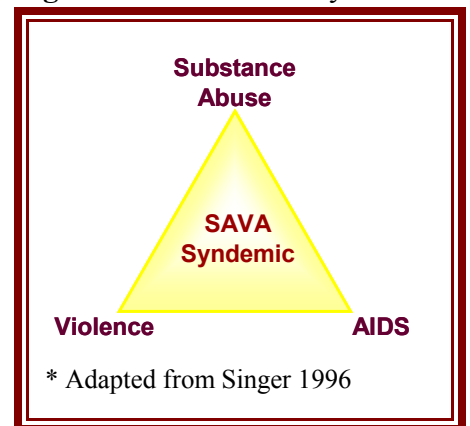
Figure 1 A Syndemic Network



The first syndemic to have been named and analyzed in the professional public health literature was reported by Merrill Singer. Comprised of substance abuse, violence, and AIDS, the “SAVA” syndemic conveyed what he saw as inextricable and mutually reinforcing connections between three conditions that disproportionately afflict those living in poverty in U.S. cities (Figure 2; Singer 1994; 1996). The following passages explain why Singer introduced the term:

"Commonly, violence, substance abuse, and AIDS have been described as concurrent epidemics among inner-city populations. However, the term epidemic fails to adequately describe the true nature of the contemporary inner city health crisis, which is characterized by a set of closely interrelated, endemic and epidemic conditions, all of which are strongly influenced by a broader array of political-economic and social factors, including high rates of unemployment, poverty, homelessness and residential overcrowding, substandard nutrition, infrastructural deterioration and loss of quality housing stock, forced geographic mobility, family breakup and disruption of social support networks, youth gang formation, and health care inequality (Wallace R, 1988; 1990; Wallace D, 1990).

Figure 2 The SAVA Syndemic*



We have introduced the term "syndemic" (Singer M, 1994) to refer to the set of synergistic or intertwined and mutual [sic] enhancing health and social problems facing the urban poor. Violence, substance abuse, and AIDS, in this sense, are not concurrent in that they are not completely separable phenomena. Rather, they emerge in the lives of participants in our study as closely intertwined threads in the often tattered fabric of their daily lives" (From Singer M, Romero-Daza N. 1997).

The notion that syndemics are a distinct phenomenon is a logical progression from the work that Rodrick and Deborah Wallace had been doing on the "synergism of plagues" (Wallace R, 1988; Wallace R, Wallace D, 1997; Wallace D, Wallace R, 1998). The particular synergism at the center of their research arose in New York City after implementing a 1969 public policy known as "planned shrinkage" (i.e., deliberately withdrawing municipal resources from selected neighborhoods to free up land and funds for alternative uses). By combining methodologies from epidemiology and ecology, the Wallaces and their colleagues have documented "a self-reinforcing, interactive mix of

contagious urban decay and deterioration in both public health and public order" after fire services were removed and rearranged under the policy of planned shrinkage (Wallace R, Wallace D, 1997). The following passage describes how in the aftermath of this policy several "separate" diseases were in fact tied together, ultimately limiting life expectancy for those most heavily afflicted.

"Many poor neighborhoods simply collapsed...the South Central Bronx, for example, lost 80% of both housing units and population between 1970 and 1980. About 1.3 million white people left New York as conditions deteriorated from housing overcrowding and social disruption. About 0.6 million poor people were displaced and had to move as their homes were destroyed. A total of almost 2 million people were uprooted, over 10% of the population of the entire Standard Metropolitan Statistical Area...Out of the overcrowding and the social unraveling of the community came epidemics of contagious disease and contagious behavior problems both in the remnants of the burned out neighborhoods and in the newly crowded neighborhoods receiving refugees: tuberculosis, measles, substance abuse, AIDS, low-weight births, and violence. Life expectancy of elderly blacks declined from 1970 to 1980 after decades of increase and in contrast to that of elderly whites which increased uninterruptedly." (From: Wallace D, Wallace R, 1998. page xvi).

A close reading of public health history reveals that many people have understood the attributes of syndemics without using this term. Insightful community leaders, social and behavioral scientists, health educators and others have a tradition of addressing connections between health problems and even between health and social problems. Yet, their work at the community level has been criticized for falling outside the limits of accepted frameworks grounded in the categorical assumptions of formal prevention science.

The conceptualization of a syndemic is significant because it expands the boundaries of public health science and action. The prospect of organizing resources around a syndemic orientation joins the science of epidemiology with the action agenda of community leaders, yielding a framework that can guide initiatives of greater size and complexity than ever before. This perspective complements single-issue prevention strategies that may be effective in controlling discrete problems but often are mismatched to the goal of improving community health in its widest sense.

What Principles Characterize a Syndemic Orientation?

A syndemic orientation is primarily distinguished from other perspectives by its explicit emphasis on examining connections between health-related problems. With this concern, it offers a broader framework for understanding how multiple health problems interact in particular communities. A syndemic orientation elevates public health inquiry beyond its many individual categories to examine directly the conditions that create and sustain overall community health.

The idea of preventing syndemics builds upon proven principles of epidemiology, which have been applied largely to the first tier of a highly complex world. The transforming effect of increasing scale is captured by the Sufi saying

*You think that if you understand one,
you understand two-because one and one are two.
But you must also understand "and."*

Similarly, the notion of a syndemic shows that at the community level there is more to prevention science than the study of isolated health problems. It reminds us that we do not yet know precisely what happens when two (or more) epidemics interact, nor how powerful interventions can be if they are planned to disrupt those forces that hold multiple diseases together.

Acknowledging the distinction between a single epidemic and the phenomenon of syndemics expands the science, practice, and policy aspects of prevention. Traditionally, research protocols, prevention programs, policy interventions, and other aspects of public health practice have focused on one disease at a time, leaving other health problems to be addressed by parallel enterprises. This categorical (i.e., single issue) approach is often used even though there is a high probability that several of the conditions that threaten a given community's health will have common social, environmental, behavioral, or biological determinants. Under a syndemic orientation, such forces would be addressed in an integrated, networked fashion.

The forthcoming *Encyclopedia of Public Health* contains an entry that describes the unique conceptual plane inherent in a syndemic orientation. Writing about syndemics within the broader realm of anthropology and public health, Kate MacQueen observes that

"The syndemic model provides an important intermediate model that frames the investigation of community level outcomes in terms of individual behavior, local processes, and higher level processes. The syndemic model raises difficult questions and challenges public health to address the root causes of health disparities. By introducing a multi-level, dynamic epidemiological perspective, it points toward the need to develop and evaluate systems- and community-level interventions that target linked processes." (From: MacQueen KM, 2002)

Whereas the usual public health approach begins by defining the disease in question, a syndemic orientation first defines the community in question. With this frame of reference, it goes on to identify links among the entire set of issues that create excess burden of disease among the community's members. In practice, a syndemic orientation follows a specific line of questioning:

- Who is sick (with which diseases)?
- Why those people?
- Why those diseases?
- What can be done to create (or restore) the conditions for optimal health?

- Under what circumstances do interventions contribute to improvements in health status and health equity?

These are provocative questions because diseases in human populations do not occur randomly. In virtually all societies, the heaviest burden of disease falls upon those who are socially marginalized, disenfranchised, or oppressed. With few exceptions, even emerging diseases that first strike members of the majority eventually gravitate to take hold among minorities. This dynamic concentrates disease among disadvantaged groups, who then become even more vulnerable as health threats reinforce one another in a vicious cycle.

The clustering of health-related problems can occur for many reasons.¹ For instance, "separate" health concerns are actually linked if they

- *Are caused by the same biological agent* (e.g., bubonic, pneumonic, and septicemic plague are different diseases, each with a distinctive clinical manifestation and medical course, yet all three are caused by the same organism, *Yersinia pestis*)
- *Share risk or protective behaviors* (e.g., cancer, heart disease, emphysema, and dozens of other diseases are all linked to tobacco use)
- *Respond to similar environmental conditions* (e.g., obesity, diabetes, and asthma are all affected in part by a community's transportation infrastructure)
- *Have reciprocal or interdependent effects* (e.g., alcoholism and depression can feedback upon each other exacerbating both conditions)
- *Are managed by the same or similar organizations* (e.g., strategies for addressing intentional injury place a greater emphasis on primary prevention when they are planned and evaluated by public health organizations, as compared to approaches taken by law enforcement, criminal justice, or even mental health agencies. These distinctions underscore the fact that all programs under an organization's sphere of responsibility tend to be commonly affected by that organization's context, including its core philosophy, mission, leadership, management, resources, partners, history, and other collective attributes).

When several health problems concentrate by person, place, or time, the real forces that connect them are often unrecognized or minimized due to the categorical nature of most epidemiological analyses (notable exceptions can be found in social epidemiology; see Krieger N, 2001a, 2001b). The problem, however, is not inherent in the science of epidemiology. On the contrary, epidemiologists are trained to see diseases emerging from interactions of an agent, host, and environment (e.g., CDC 2001). This same typology (or one similar) could perhaps be used on a

¹ This is a preliminary list of potential epidemic ties. Research is underway to explore and define a complete typology of the ways that health-related problems could be linked

higher level of analysis to investigate connections between different diseases, but such questions are not commonly asked.

A syndemic orientation, by definition, prompts extensive inquiry into the conditions that create and sustain health, questioning how and why those conditions might differ among groups. For these reasons a syndemic orientation provides a more precise scientific framework for understanding and preventing the conditions that perpetuate health disparities.

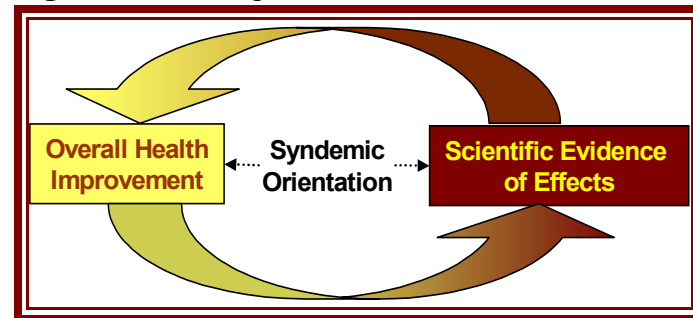
When Is It Appropriate or Inappropriate to Use a Syndemic Orientation?

The medical model of disease specialization, once praised for its utility and versatility, is proving inadequate for confronting such contemporary public health challenges as eliminating health disparities. Although conventional prevention programs have had strong effects, for the most part the categorical approach has failed to assure the conditions for overall community health, and it has done little to spread successes equitably among subgroups in society.

From the perspective of community leaders, it is no longer acceptable to concentrate on preventing some diseases while allowing others to go unchecked, especially when many of the most burdensome problems have common causes. Instead, more and more initiatives aim to reduce the overall burden of disease in the community. They seek new approaches for organizing resources and framing problems in ways that will address connections among all those issues that threaten health and wellbeing (Institute of Medicine, 1996).

Unfortunately, comprehensive community initiatives generally encounter barriers and receive limited institutional support because they run counter to the assumptions of prevailing scientific frameworks (see Schorr, 1997). A profound tension now exists between the desire to engage in comprehensive health improvement initiatives and the need to present scientific evidence of effects based on categorical models of disease (Figure 3). A syndemic orientation offers the possibility to cut through this bind. It could, in fact, open the way to establishing new theories of change, new alliances among interest groups, new funding policies, new insight about the root causes of health and social problems, and new levels of achievement in improving population health.

Figure 3 Balancing Values



The core functions and values of public health provide a practical mandate for adopting a syndemic orientation. The mission of public health is to "fulfill society's interest in assuring the conditions in which people can be healthy" (Institute of Medicine, 1988), which entails organized, interdisciplinary efforts that identify and reduce the physical, mental, and environmental health concerns of communities. The mission to assure the conditions for health also carries the responsibility for declaring what those conditions are, measuring them, and ensuring that they are available to all.

Specifically, public health organizations are guided by three core functions, ten essential services, and five operating principles (Table 1; see also DHHS, 1999; Koplan J, 1999). These tenets emanate from a holistic view of community health, one that accepts the need to continuously improve health and protect communities against all threats to their well-being. Certain health problems (e.g., outbreaks of disease) can be controlled effectively using categorical (bounded) interventions. A syndemic orientation, however, is more likely to be effective as an operational strategy for fulfilling public health’s core responsibilities, which require ecological (unbounded) solutions (Green LW, Kreuter MK, et.al. 1999).

Table 1 Core Public Health Functions, Essential Services, and Operating Principles

Core Functions
<ul style="list-style-type: none"> • Assessment - assessment and monitoring of the health of communities and populations at risk to identify health problems and priorities • Policy Development - formulating public policies, in collaboration with community and government leaders, designed to solve identified local and national health problems and priorities • Assurance - assuring that all populations have access to appropriate and cost-effective care, including health promotion and disease prevention services, and evaluation of the effectiveness of care
Essential Services
<ul style="list-style-type: none"> • Monitor health status to identify community health problems. • Diagnose and investigate health problems and health hazards in the community. • Inform, educate, and empower people about health issues. • Mobilize community partnerships to identify and solve health problems. • Develop policies and plans that support individual and community health efforts. • Enforce laws and regulations that protect health and ensure safety. • Link people to needed personal health services and assure the provision of health care when otherwise unavailable. • Assure a competent public health and personal health care workforce. • Evaluate effectiveness, accessibility, and quality of personal and population-based health service. • Research for new insights and innovative solutions to health problems.
Operating Principles
<ul style="list-style-type: none"> • Use science as a basis for decision-making and public health action. • Expand the quest for social equity through public health action. • Make efforts outcome oriented. • Be accountable. • Perform enthusiastically and effectively as service agencies.

What Are The Advantages and Limitations of a Syndemic Orientation?

At this early stage of development, it is difficult to predict what advantages and limitations will be found by adopting a syndemic orientation. Network members will discover and negotiate those over time. Part of the promise inherent in a syndemic orientation, however, lies in its ability to provide a mandate for

- intervening on forces that cause multiple health-related problems to cluster together
- repairing fragmentation of the infrastructure needed to protect the public's health
- expanding research and action agendas by linking health and social justice
- introducing new methods of analysis and synthesis
- establishing a science base for a “community health bill of rights.”

Advantages like these might accrue in the long term, after a syndemic orientation has matured and become institutionalized. Possible benefits closer to the horizon include enhanced collaboration within the public health sector, closer ties between public health and other sectors of society, stronger relationships between community leaders and health professionals, and closer connection between public health and social justice. The sections below provide a brief rationale for each of these benefits.

Enhanced Collaboration Within the Public Health Sector

Acceptance of a syndemic orientation will almost certainly provide a catalyst for renewed collaboration throughout the public health system and beyond. As long as the most valued outcomes of prevention are measured as reductions in specific diseases, at present, practitioners have little incentive to collaborate across program boundaries to improve the public's health. This deprives prevention science of the energy that is unleashed through collaboration, while also fueling inefficiency and bureaucratic frustration.

The usual incentives for prevention programs reward organizations when their programs (a) receive notoriety, (b) survive over time, (c) get more money, or (d) produce results that are directly attributable to planned actions. These are significant achievements, but they are insufficient for guiding program and policy development at the community level. Without additional incentives for broader collaboration, a community could have many effective programs but still have people who are no healthier.

Imagine, for example, a community with effective programs under way for preventing heart disease, cancer, HIV, tuberculosis, influenza, asthma, and lead poisoning but extraordinarily high rates of depression, alcoholism, homicide, and foodborne illness. For health to get better in a practical sense, the major interconnecting causes of morbidity and mortality must be identified and addressed simultaneously. Under a syndemic orientation it might be possible to mobilize alliances among a wide range of partners, who could be held accountable and rewarded for improving health status and health equity in the community. Nothing less fulfills the mission of public health.

Closer Ties Between Public Health and Other Sectors of Society

Stronger partnerships among public health organizations are imperative, but the work cannot stop there. Natural partners in the effort to prevent syndemics must also be sought outside the formal public health system. Using research and evidence from experience as a guide, advocates of a “theory of change” approach are identifying pathways through which actions taken in "non-health" sectors eventually affect health. Indeed, past research has shown that some of the strongest predictors of health status are social determinants, including employment, social equity, and early childhood development. (Wilkinson and Marmot, 1998).

Changing determinants of health that are not controlled by authorities within the health sector requires coalitions that reach beyond the confines of familiar partnerships. Working from a position of solidarity with community members, agency leaders will be called upon to forge partnerships with relevant organizations all along the identified pathways of influence, regardless of how far afield from classical public health they reach. Mapping those pathways is analogous to mapping the human genome, a grand challenge that promises to be as beneficial in propelling the development of prevention science as the Human Genome Mapping Project has been for molecular biology (Schorr, 1997). Some forces other than public health that might emerge as having strong ties to health status and health equity are listed in Table 2.

Table 2 Some Factors Outside of Public Health that Affect Health Status and Health Equity

<ul style="list-style-type: none"> • Addiction services (prevention, treatment) • Agriculture • Architecture • Economy (labor, management commerce, fiscal policy) • Education • Energy • Entertainment • Environment (land, air, water, biodiversity, atmosphere, light, temperature) • Faith • Governance (local, state, federal, international) 	<ul style="list-style-type: none"> • Human service (child care, welfare, health care) • Housing • Information (journalism, media) • International relations • Justice (law enforcement, public safety, civil rights, human rights) • Land use (regional planning, urban design) • Mental health • Philanthropy • Recreation (sports, arts, humanities) • Security (defense) • Science and technology (research and development) • Transportation
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Fortunately, the importance of forming inclusive partnerships to protect the public's health is becoming more widely understood. In fact, efforts are already under way to position public health services as shared responsibilities of an entire system of organizations working in partnership with their constituents, and not just governmental health departments (NACCHO, 2001). This work is essential for building society's organizational capacity to understand and prevent both epidemics and syndemics.

Stronger Relationships Between Community Leaders and Health Professionals

When forging partnerships, it is also important to strengthen the relationship between community

leaders and health professionals. These stakeholders need each other, but they often approach their work using different frames of reference, with different values and standards for success.

One persistent source of tension between the two groups centers on how to define the proper scope for health improvement projects. Because resources are almost always allocated to specific health problems, professionals often try to keep the scope as narrow as possible, believing, that this will enhance the chances of demonstrating attributable effects. Community leaders tend toward a different view. Aware of their neighborhood's history and concerns, they are better able to place problems in context and consider them as a group. This approach generally leads them to conclude that comprehensive change (often at a systems level) is the more sensible strategy. The alternative--addressing specific instances of a systemic problem--to them is like treating symptoms instead of the disease.

Under many scientific frameworks, the tension between categorical and comprehensive approaches has been notoriously difficult to resolve. Frequently, resolution means sacrificing either the project's evaluability (because the program becomes too diffuse and unstable) or its chances of achieving meaningful results (because there is a focus on small problems and not the big picture) (see Schorr, 1997). A syndemic orientation offers a better way to resolve the dilemma.

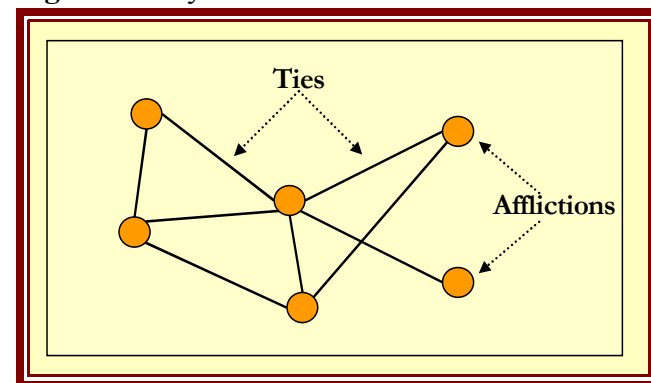
The practical advantage of a syndemic orientation can be seen with a network diagram (Figure 4). The nodes represent diseases, and the edges represent ties, or forces that cause the diseases to concentrate by person, place, or time. Professionals, trained as disease specialists, focus mainly on the nodes. While community leaders, steeped in neighborhood context, tend to focus on the ties. Beyond the diseases themselves, community advocates see forces that hold the entire constellation of disorders together. Those connecting forces can be as much of a problem as the diseases themselves. Sometimes they are even more so, because it is logical to assume that the overall structure of disease in the community will persist unless those connecting forces are addressed.

The views of health professionals and community leaders deserve respect and dignity because each fills in a critical part of the puzzle. With this foundation, health professionals and members of the public could develop a common language and forge a closer, more authentic connection in their work. With a syndemic network in mind, planners can devise ways of weakening diseases at the nodes while simultaneously disrupting ties that allow those diseases to accumulate into an unwieldy burden for the community. Together these strategies set the stage for effective collaboration at a scale that better matches the complexity of transforming community conditions and systems.

Closer Connection Between Public Health and Social Justice

A syndemic orientation can also advance a specific course of social change, one focused on the connection between health and social justice. Public health professionals who operate under a syndemic orientation would have a stronger incentive to collaborate with community members in

Figure 4 A Syndemic Network



understanding the entire set of forces that create excess burden of disease. By examining epidemics in context and seeing syndemics where they exist, health scientists might begin to identify a different set of risk and protective factors and mobilize to change them. In all probability these factors would include those that human rights advocates see as fundamental to their work (i.e., education, justice, economic opportunity, housing, environmental protection, self-determination, social cohesion, peace, and so forth).

Under a syndemic orientation, alliances might be strengthened between sectors of society, thereby creating a more powerful mandate for directed social change. Ultimately, the analyses conducted using a syndemic orientation could provide the science base for a community health bill of rights. Such a document might better define the conditions that all human groups deserve and should expect so as to create and sustain maximal health, quality of life, and social justice.

Limitations

As progress in exploring syndemics continues, there will also be problems to avoid. Pitfalls are inherent in introducing an unfamiliar term, defining practical boundaries for networks within networks, building trust among groups with a history of weak collaboration, and engaging those who have been previously excluded from decisions about public health science and action. Although the challenges facing proponents of a syndemic orientation are considerable, they must be weighed against known limitations of maintaining the status quo. By that standard, there is a clear mandate to explore all perspectives that may yield viable alternatives.

What Procedures are Available for Planning and Evaluating Initiatives to Prevent Syndemics?

A syndemic orientation reinforces the idea that the focal mission of public health goes beyond epidemic control to include improvement in community health. To a profession that has become deeply fragmented, confronting syndemics could restore a sense of wholeness and common purpose. To be meaningful, this unification must also be incorporated in the values and procedures used to plan program strategy and to document achievements.

The methods for planning and evaluating syndemic prevention initiatives draw upon established techniques as well as innovative options that have been, and are continuing to be developed. Planners and evaluators of comprehensive health improvement initiatives will benefit by using a syndemic orientation because it provides a systematic framework for

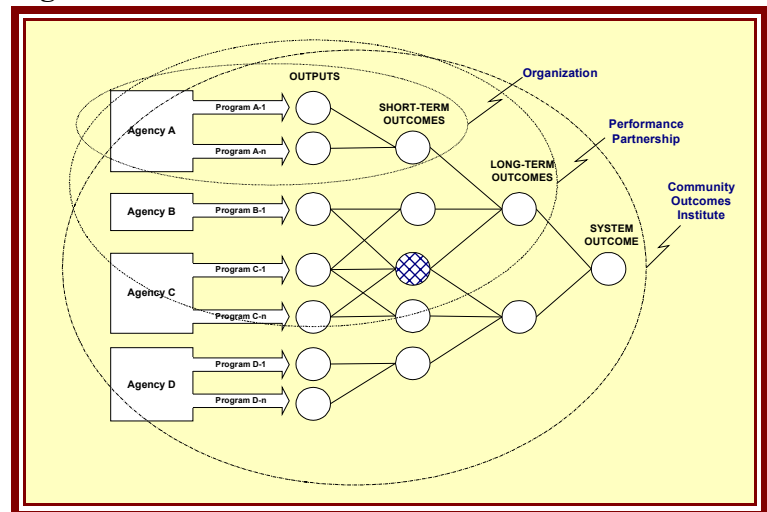
- Differentiating between attribution and contribution
- Expanding outcome measures to include summary measures of population health
- Defining conditions for health
- Charting progress using navigational statistics
- Documenting changes in community conditions and systems
- Recognizing the difference between communities and other objects of inquiry
- Distinguishing between principles of research and program evaluation

Differentiating Between Attribution and Contribution

Valued outcomes in syndemic prevention include the control of specific diseases, but that is not all. To achieve meaningful gains in health, programs and policies must also be aligned across a number of problem areas so that they have a combined effect on reducing the burden of disease from interrelated causes. With this focus, discourse could shift from a fragmented emphasis on attribution (i.e., epidemic control) to a united search for contribution (i.e., systems change, health improvement, increasing health equity).

Through the analysis of contribution, new independent variables might be found, and linked groups of dependent variables could be used to differentiate effects for different degrees of collaborative action. Tools such as the outcomes network (Figure 5), which incorporate higher degrees of organizational depth than conventional logic models, can help clarify complex relationships and spot areas of convergence or divergence in planners' theories of change. This tool can also be used to negotiate lines of accountability, indicating the boundaries within which credit for accomplishments will be shared among all partners.

Figure 5 Outcomes Network



Expanding Outcome Measures to Include Summary Measures of Population Health

An expanded range of health status measures can also be used as the outcomes for syndemic prevention initiatives. Although there is near universal consensus that no single measure is appropriate for capturing the effects of health promotion initiatives, there remains widespread confusion about how to identify and measure outcomes that matter.

Usually, planners and evaluators must either conduct parallel analyses, substituting different outcomes for different facets of their program, or face the unpleasant task of looking for effects only in selected categorical areas. The latter option is often chosen, despite the fact that it alienates those partners who construe their missions differently and leaves undocumented important changes that might indeed have occurred. For example, even though an initiative might have triggered profound changes in community conditions and systems, the effects reported tend to be only those preferred by the categorical funding source(s).

The emergence in recent years of “summary measures of population health” (IOM, 1998) adds an important new class of outcomes to consider. Also known as “burden of disease” measures (Murray CJL, et.al., 1996), they combine information about morbidity and mortality or address morbidity alone, often across a wide range of health areas. As such, they possess an intrinsic syndemic orientation. Burden of disease measures summarize health status relative to clusters of conditions instead of singularly defined disease states. Compared with categorical measures, burden of disease

measures provide decision makers with more complete and sensitive information about overall population health, although they “incorporate critical but not necessarily obvious or well-accepted judgments about whose life or what kind of life has meaning and worth” (IOM, 1998).

As such, they possess an intrinsic syndemic orientation. Burden of disease measures summarize health status relative to clusters of conditions instead of singularly defined disease states. Compared with categorical measures, burden of disease measures provide decision makers with more complete and sensitive information about overall population health, although they “incorporate critical but not necessarily obvious or well-accepted judgments about whose life or what kind of life has meaning and worth” (CDC, 2000). Since 1993, the Behavioral Risk Factor Surveillance System has asked respondents to state how many days in the last 30 their (mental or physical) health was not good. Striking findings have been reported using these data (CDC, 2001). If confronted with summary measures of population health, program planners, policy makers, and the general public will likely call for interventions with a syndemic character, that is, interventions addressing directly the conditions that support overall health.

Defining Conditions for Health

The charge to assure the conditions for health is a charge to remake the world into a safer healthier place. It is a mandate to construct an ecology free of known health hazards, which protects people equally, and which is equipped to respond to emerging problems. Before intervention plans are approved or evaluation strategies selected, health planners must be clear about the world in which their constituents want to live and what legacies will be left for future generations.

Nainoa Thompson, lead navigator of the Polynesian Voyaging Society, understands well the responsibility of planning voyages. In 1995, he was instrumental in helping the children of Hawaii articulate their vision for the future, which eventually became formalized as the Ke Ala Hōkū Critical Indicators (Hawaii Community Services Council, 1999). Here, Nainoa Thompson talks about an experience in which he and 18 school children came to appreciate the deep significance of assuring the conditions for health. He started by asking,

“Where do you want your children to live? Without hesitation they all told me that they wanted their children to live in Hawaii. Then I asked, “Why?” And they told me they wanted all those things that were special about Hawaii for their future children. “How do you know,” I asked, “that in twenty years those things that you consider special are still going to be here?” At first they all raised their hands but when they really digested the question every single one of them put their hands down. In the end, there was not a single hand up. No one could answer that question.

It was the most uncomfortable moment of silence that I can remember. We all sat there, looking at each other, without an answer to a fundamental question that seemed so powerfully important to the future of our children. That was the defining moment for me. I recognized that I have to participate in answering that question otherwise I am not taking responsibility for the place I love and the people I love” (Thompson, 2000).

Charting Progress Using Navigational Statistics

The image of a navigational voyage is perhaps the most common metaphor used to describe public health ventures. Yet navigational properties are not incorporated formally into the procedures used for charting progress and understanding change in public health. Explicit mathematical models for navigation are, however, used in other branches of science, such as seamanship, geography, oceanography, zoology, and geology, where it is common to collect and analyze directional data (i.e., data describing movement from one place to another).

Scientists who study navigation use navigational statistics, also known as circular statistics because they are based on polar coordinates instead of the Cartesian grid (Figure 6; Jammalamadaka SR, Sengupta A., 2001; Fisher NI., 1993). These are the only valid approaches for analyzing directional data. Methodologists are unequivocal about the potential biases involved in using other procedures for data of this kind.

- *"The questions posed by navigation experiments can only really be answered by the application of circular statistics to the data obtained"* (Baker RR, 1981).
- *"The methods advocated for usual linear data are not only often misleading but also not applicable to directional data"* (Sengupta A, 2000).

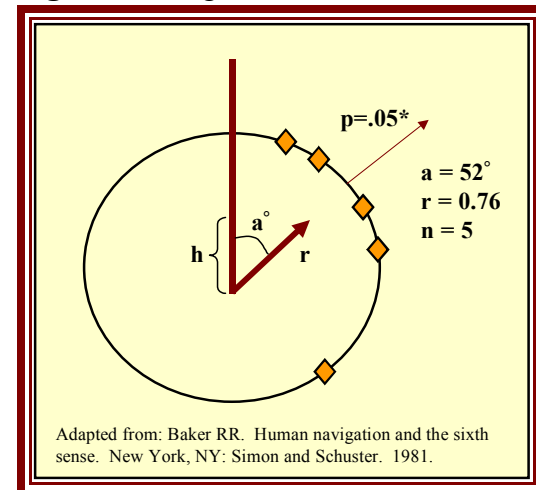
Directional data usually refer to movement through physical space, but with a suitable theory they may also be used to model transitions through social space, such as the movement from one set of community conditions to another. Public health professionals in the 19th century (e.g., Florence Nightingale) presented their work using data displays from circular statistics. A movement away from these procedures took place as Cartesian methods became the dominant techniques in medicine and social science. In the context of a syndemic prevention initiative, navigational statistics might well provide the elusive quantitative tools necessary to demonstrate the effect of community and systems change on health status.

Documenting Changes in Community Conditions and Systems

Community conditions and systems encompass the social, physical, organizational, and other ecological attributes that make each neighborhood or community unique. Because these factors have profound effects on health and well-being, public health advocates, especially those who operate from a syndemic orientation, must be concerned with identifying harmful conditions and creating positive changes. Those changes could include new or modified

- *Programs, policies, and practices* (i.e., things that organizations do, such as provide services, make rules, follow procedures, and link with certain partners).

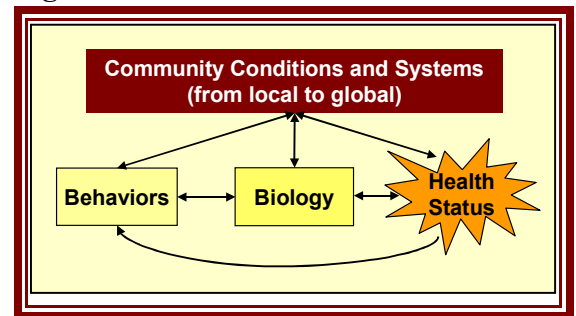
Figure 6 Navigational Statistics



- *Social and physical infrastructure* (i.e., things about the community itself, such as how buildings are designed; how space is laid out; the air/water/soil/food quality; proportion of owner-occupied housing; number of primary care clinics; connectivity of walking trails; availability of fresh fruits and vegetables, etc.).
- *Beliefs and social norms* (i.e., things that people believe or perceive, such as the proportion of residents who think that racism is a problem in the community; or the level of support for higher taxes on cigarettes and alcohol).

Changes in community conditions and systems generally have an indirect effect on health status because they alter individual behavior (e.g., tobacco use) or biology (e.g., blood pressure), which in turn affects health. Some system changes can exert a direct effect on health, however, such as those that remove harmful exposures from the environment or eliminate obstacles to life-saving services (e.g., improve response time by police, fire fighters, or ambulances) (Figure 7).

Figure 7 Direct and Indirect Effects



Practitioners working to prevent syndemics ought to identify, advocate for, and celebrate positive changes while being vigilant about tracking unexpected or unwanted occurrences, particularly those that threaten health or undermine the effectiveness of public health programs. Indeed, documenting the persistence of harmful conditions can be a powerful tool for advocacy when positive changes are not occurring.

Measures of ecological changes are related to but different from indicators that aggregate individual behavior. For example, the proportion of children in a community who have up-to-date immunizations is a summary of individual behavior. This statistic might rise or fall depending upon factors like the number and location of immunization clinics in the neighborhood, the quality of those clinical services, or the level of community trust in health workers, all of which are attributes of the community conditions and systems.

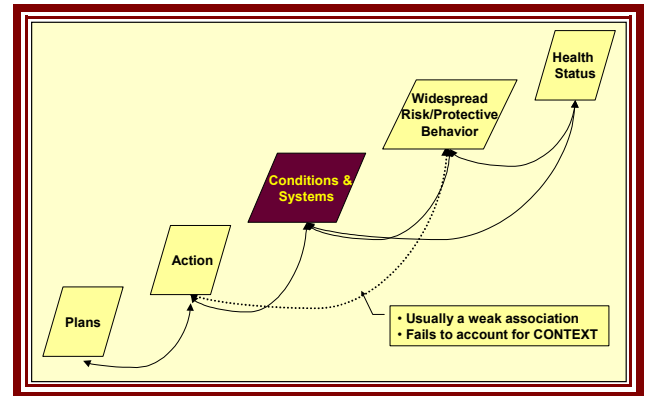
Although achievements in health promotion must ultimately be measured as improvements in health status and quality of life, it often takes decades for those effects to become visible. Earlier indicators of progress are widespread changes in biology or behavior. Still earlier indicators are changing community conditions and systems, which provide a sign that health promotion initiatives are on track for success.

Thanks in part to pervasive information technology, systematically recording changes in community conditions and systems is becoming more and more feasible. In fact, health officials are now exploring ways of working closely with community members to build surveillance systems that monitor changes in community conditions, just as they now track trends in behaviors, diseases, and other health events. Unlike traditional objects of public health surveillance, many changes in conditions and systems can be recorded prospectively or identified retrospectively. This flexibility

is due to the fact that these changes tend to be either present or absent (i.e., a walking trail exists or it does not; schools have a no-smoking policy for staff or not; etc.).

Recording changes in community conditions and systems is analogous to keeping a community journal and provides the foundation for telling a factual, evidence-based story about how the community has been changing. This is an important piece of the puzzle for understanding how successful initiatives to prevent syndemics work. Analyses that include measures of conditions and systems are stronger because they account for context (Figure 8).

Figure 8 Using Context to Strengthen Analyses



One hypothesis for the disappointing ratio of health promotion programs conducted to those that achieve success is that there are unacknowledged and unmeasured contextual influences that mediate program effectiveness (Kreuter M, et.al, 1999). From the perspective of a practitioner or an analyst, the relationship between intervention action and health objectives (either behavioral or biological) can be established more forcefully when community conditions and systems are taken into account.

Recognizing the Difference Between Communities and Other Objects of Inquiry

Part of the difficulty in planning and evaluating comprehensive community initiatives stems from the extent to which communities are unlike other objects of inquiry. Communities behave in ways that are more like complex adaptive systems than like stable bounded entities. In a community, for example, interconnecting parts function as a whole, with profound feedback and delay effects; the essential properties of community life can be changed or damaged if influences are added or removed; the arrangement of resources, including who has access to them, is crucial; and the behaviors of people or organizations are affected by the community's total structure; change the structure and the behaviors can change as well. Eoyang and Berkas (1999) have summarized the attributes of complex adaptive systems and gone on to identify tools and techniques for evaluation that seemed well-matched to those attributes (Table 3).

Distinguishing Between Principles of Research and Program Evaluation



Far more work remains to be done in identifying analytic methods that are appropriate for understanding how whole communities function and change over time, but methodologies can only be used appropriately when the principles guiding their application are explicit. Here, there is an opportunity to clarify much of the confusion that surrounds the evaluation of interventions that use a syndemic orientation.



Efforts to achieve directed social change can be thought of in multiple ways. Often they are seen as social experiments, at other times as an integral part of social learning. When thinking of community initiatives as experiments, it is logical to apply conventional research principles, but when the enterprise of social learning takes greater prominence, program evaluation principles are often a better fit. Few decision makers are trained to recognize the distinction between these perspectives;

indeed, most people view evaluation as research. Not surprisingly, research procedures are often misapplied to the task of learning whether and under what conditions community interventions can be effective in improving health status.

The vast majority of public health work does not, and should not, take place in the context of experimental research. At the same time, everything attempted in the effort to protect the public’s health ought to be the basis for learning and improvement. This distinction has profound implications for planning, decision making, framing questions, and nearly every other aspect of program design and development (Table 4).

Table 4 Conventional Principles of Research and Program Evaluation

	Research 	Program Evaluation 
Planning	Scientific Method <ul style="list-style-type: none"> • State hypothesis • Collect data • Analyze data • Draw conclusions 	Framework for Program Evaluation <ul style="list-style-type: none"> • Engage stakeholders • Describe the program • Focus the evaluation design • Gather credible evidence • Justify conclusions • Ensure use and share lessons learned
Decision Making	Investigator-controlled <ul style="list-style-type: none"> • Authoritative 	Stakeholder-controlled <ul style="list-style-type: none"> • Collaborative
Setting Standards	Validity <ul style="list-style-type: none"> • Internal (accuracy, precision) • External (generalizability) Repeatability	Program Evaluation Standards <ul style="list-style-type: none"> • Utility • Feasibility • Propriety • Accuracy
Framing Questions	Facts <ul style="list-style-type: none"> • Descriptions • Associations • Effects 	Values <ul style="list-style-type: none"> • Merit (i.e., quality) • Worth (i.e., value) • Significance (i.e., importance)
Constructing Knowledge	Isolate Changes and Control Circumstances <ul style="list-style-type: none"> • Narrow experimental influences • Ensure stability over time • Minimize context dependence • Treat contextual factors as confounders that necessitate randomization, adjustment, or statistical control • Control or comparison groups are a necessity 	Incorporate Changes and Account for Circumstances <ul style="list-style-type: none"> • Expand to see all domains of influence • Encourage flexibility and improvement • Maximize context sensitivity • Treat contextual factors as essential information using system diagrams, logic models, and hierarchical or ecological modeling • Control or comparison groups are optional (and sometimes harmful)

	Research 	Program Evaluation 
Collecting Evidence	Sources <ul style="list-style-type: none"> Limited number (accuracy preferred) Sampling strategies are critical Concern for protecting human subjects Indicators/Measures <ul style="list-style-type: none"> Quantitative Qualitative 	Sources <ul style="list-style-type: none"> Multiple (triangulation preferred) Sampling strategies are critical Concern for protecting human subjects, organizations, and communities Indicators/Measures <ul style="list-style-type: none"> Mixed methods (qualitative, quantitative, and integrated)
Analyzing & Synthesizing	Timing <ul style="list-style-type: none"> Once (at the end) Scope <ul style="list-style-type: none"> Focus on specific variables 	Timing <ul style="list-style-type: none"> Ongoing (formative and summative) Scope <ul style="list-style-type: none"> Integrate all data
Making Judgments	Implicit <ul style="list-style-type: none"> Attempt to remain value-free 	Explicit <ul style="list-style-type: none"> Examine agreement on values State precisely whose values are used
Justifying Conclusions	Attribution <ul style="list-style-type: none"> Establish time sequence Demonstrate plausible mechanisms Control for confounding Replicate findings 	Attribution and Contribution <ul style="list-style-type: none"> Establish time sequence Demonstrate plausible mechanisms Account for alternative explanations Show similar effects in similar contexts
Using New Knowledge	Disseminate to Interested Audiences <ul style="list-style-type: none"> Content and format varies to maximize comprehension 	Feedback to Stakeholders <ul style="list-style-type: none"> Focus on intended users and uses Build capacity Disseminate to Interested Audiences <ul style="list-style-type: none"> Content and format varies to maximize comprehension Emphasis on full disclosure Requirement for balanced assessment

Trends

For some time now cross-cutting trends have affected both the science and practice of public health. These trends include shifts in problem solving as well as management. Taken together, the emerging priorities in public health (Table 5) seem to reflect a struggle to overcome constraints imposed by the categorical perspective used throughout the public health system. Using a syndemic orientation, it might be possible to better define the conditions under which categorically organized interventions can be effective and the extent to which fragmentation of the public health system might itself be a barrier to the goal of protecting the public's health.

Table 5 Emerging Priorities in Public Health

Trends & Emerging Priorities	
Steps in Public Health Problem Solving	
Define the problem	<ul style="list-style-type: none"> • Eliminating health disparities
Determine the cause	<ul style="list-style-type: none"> • Social determinants of health • Community context • Adverse childhood experiences
Develop and test interventions	<ul style="list-style-type: none"> • Comprehensive community initiatives • Ecological perspectives
Implement programs/policies	<ul style="list-style-type: none"> • Policy interventions • Community and systems changes • Adaptation to local context
Management Processes	
Creating a science base for action	<ul style="list-style-type: none"> • Community-based prevention research • Guide to community preventive services • Best practices recommendations
Forge partnerships	<ul style="list-style-type: none"> • Organizational coalitions • Community engagement and participation
Planning intervention strategy	<ul style="list-style-type: none"> • Logic models (theories of change) • Mobilizing action through prevention partners (MAPP)
Using information	<ul style="list-style-type: none"> • Evidence-based decision making • Surveillance integration • Knowledge management
Sharing power among stakeholders	<ul style="list-style-type: none"> • Organizational coalitions • Community participation
Measuring performance	<ul style="list-style-type: none"> • Outcome indicators • Community indicators and report cards • Health employer data and information system (HEDIS) • Summary measures of population health
Conducting evaluations	<ul style="list-style-type: none"> • Framework for program evaluation
Meeting accountability requirements	<ul style="list-style-type: none"> • Government performance and results act • Public health performance standards
Strengthening infrastructure	<ul style="list-style-type: none"> • Workforce development • Community capacity • Organizational networks

Trends & Emerging Priorities	
Leveraging resources	<ul style="list-style-type: none"> • Advocacy • Litigation • Public-private partnerships • Philanthropy

Faced with increasingly complex problems in communities, practitioners are reorganizing and realigning their work and in the process challenging traditional assumptions about prevention science. As trends continue to draw community residents and public health workers into more complex participatory initiatives, and as demand grows for obtaining scientific evidence of effectiveness, the need to understand more about syndemics will predictably increase.

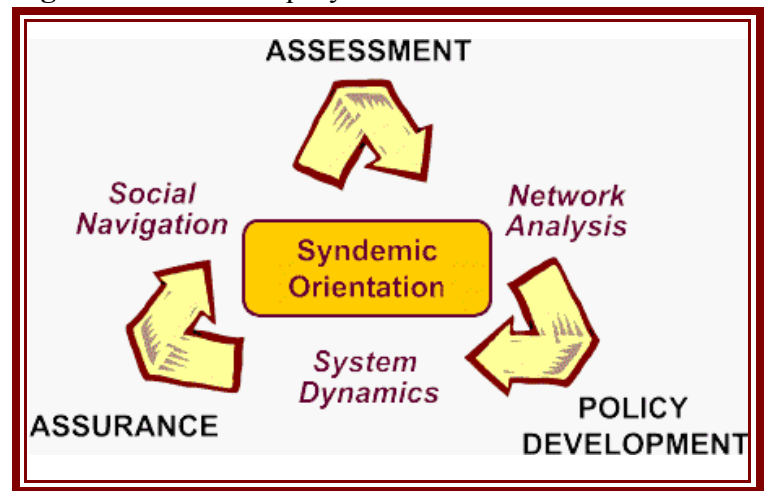
Areas for Exploration

A substantial amount of work must be done to understand what a syndemic orientation is and what it has to offer. The implications of organizing around the goal of preventing syndemics have not been systematically studied; methodologies have not been identified for planning and evaluating syndemic prevention strategies, nor are there efforts under way to prepare the public and the public health workforce to support initiatives in preventing syndemics. Even more pressing is the need to define terms and develop a glossary of easily understood definitions. Completing these tasks will help point the way to a promising new frontier for public health.

At present there is a growing consensus that a new, transdisciplinary approach is needed to solve current and emerging problems in public health. Even so, the field has not adopted a framework that transcends current tensions between science and practice at the community level. The Syndemics Prevention Network was formed to address precisely this challenge.

Work in progress includes activities designed to clarify the theory and methods for a syndemic orientation. Through scholarship, service learning, networking, and other activities members of the network are discovering new ways of protecting communities from threats to their health. Several areas of inquiry promise to yield important clues. Some topics currently being explored are listed in Figure 9. Each of these are discussed in greater depth in the work in progress area of the Web site.

Figure 9 Areas of Inquiry

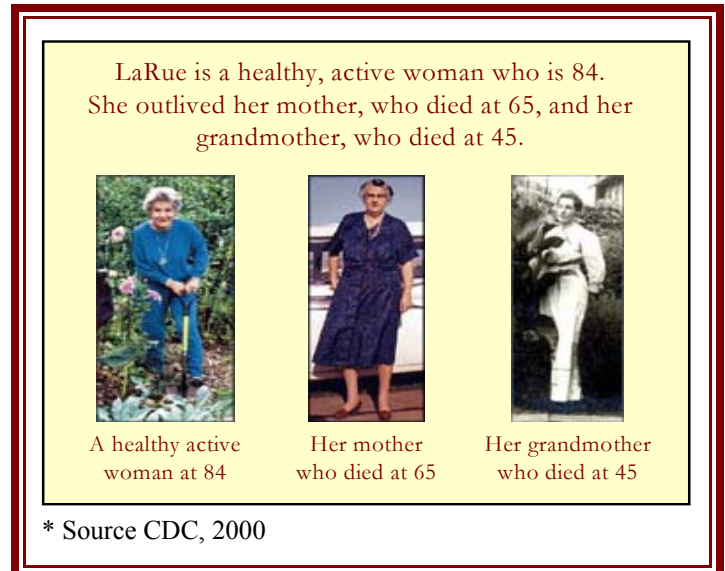


Furthering Scientific and Social Change

A person born in the United States in 1900 could expect to live about 45 years but boys and girls born in 2001 will probably live to almost 80 (Figure 10). Within living memory, the average American life span nearly doubled. This remarkable change was primarily due not to medical breakthroughs but to decisive public health actions (e.g., water fluoridation, vaccination, family planning, enactment of workplace safety laws, improving motor vehicle safety, making foods safer and healthier, promoting healthier mothers and babies, control of infectious diseases, efforts to reduce heart disease and stroke, and recognition of tobacco as a health hazard) (CDC, 1999; 2000). "Public health achievements of the 20th century dwarf those accumulated in the previous 19" (Koplan J, 1999). In the 20th century, we didn't just find ways to help people live longer in the world, we made a better world for living. That is the kind of social change that public health professionals strive to achieve.

Although the science of epidemiology has yielded remarkable achievements, even further advances can be made by incorporating into epidemiology a syndemic orientation. Public health leaders today must maintain past achievements while also confronting entrenched problems, such as health disparities, which have been notoriously resistant to change. In addition, community residents are contending with a growing number of health threats in a world that is undergoing profound social and demographic change (e.g., intensifying conflict, aging of the population, globalization, spread of information technology, environmental degradation increasing gaps between rich and poor). New ways of thinking and working will be needed to find solutions for today's and tomorrow's challenges.

Figure 10 Proof of Living a Longer Healthier Life*



A syndemic orientation offers a scientific framework that is both comprehensive and context sensitive; it transcends conventional models that focus only on single epidemics, providing a foundation for identifying and intervening simultaneously in multiple health-related problems. When compared with the alternatives, a syndemic orientation better matches the scope and complexity of the problems that public health advocates must confront. Still, we are only beginning to comprehend what it means to operate from this perspective. The Syndemics Prevention Network was organized to help spark interest in the idea of preventing syndemics and to advance our collective understanding of what this perspective entails.

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