

Social Determinants of Health

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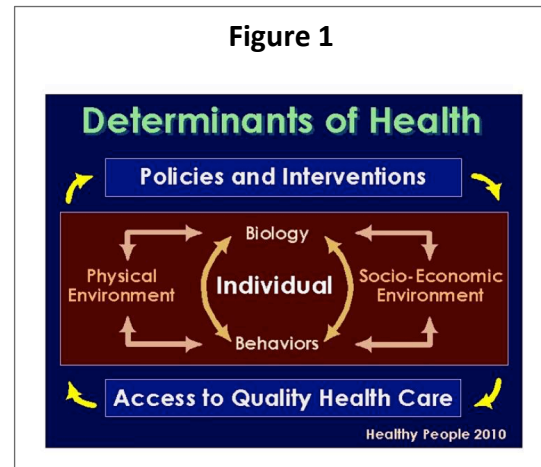
Social Determinants of Health

The ecological model of health – also known as the determinants of health – proposes that health and well-being are influenced by the *interaction* of biology, behavior, and social and physical environments mitigated by policies, interventions, and access to quality health care (see Figure 1).

Although the idea that physical environments influence health is as old as Hippocrates, and speculation about the influence of income on health dates back at least to the middle of the 19th Century, the ecological model of health is relatively new. The term “determinants of health” was first used by British physician Thomas McKeown in 1972. Despite the wide use of the term since then, there is little international concordance on what the specific determinants of health should be. For example, the U.S. Centers for Disease Control and Prevention counts the five determinants in Figure 1 (policies and

interventions are not considered determinants); between 1974 and 1996 the determinants of health recognized by the Ministry of Health in Canada grew from four to twelve. Taking a cautious approach, the World Health Organization says that many factors combine to affect the health of individuals and communities and goes on to list some of them but advises the reader that there are “many others.” While the specifics may differ on the margin, all social epidemiologists essentially agree that the determinants of health are composed of naturally occurring factors (e.g., genetic endowment, physical environment) and societal factors (e.g., income, culture, social status, education, access to and use of health services).

Social determinants of health are a subset of the ecological model and focus exclusively on the second element just described, the institutions and organizations developed by humans to structure social processes. In recent years, the list of specific social determinants has grown beyond the typical measures of socioeconomic status – income, education, and employment – to include a host of other social influences on health such as race and ethnicity, family wealth/assets, autonomy in one’s job, social cohesion/isolation, adverse childhood events, social capital, housing, and health literacy. These influences do not operate in isolation, but are interconnected and mutually reinforcing and have consequences at the individual, family, and community levels. At the same time, evidence is growing that the impact of these influences occurs across the life course. Social determinants of health are primarily responsible for *health disparities*, the unfair and avoidable differences in health status associated with socioeconomic status (SES). In other words, there is no *inherent* biological or natural explanation for why these differences in health should occur; the causes of disparities are ultimately social.



Evidence of the Influence of Social Determinants on Health in Kansas

The five graphs beginning on the next page illustrate the impact of income on health using data drawn from an annual survey conducted by the Kansas Department of Health and Environment called the Behavioral Risk Factor Surveillance Survey (BRFSS). Figure 2 shows the relationship of annual household income to the prevalence of asthma in children. The trend shows that the prevalence (weighted percentage) of asthma in children declines as household income increases. In households where the annual income is less than \$15,000 (approximately the annual salary of a full-time job at minimum wage) the rate is 14.7 percent, and in households where the income is \$50,000 or more, the rate is 8.3 percent.

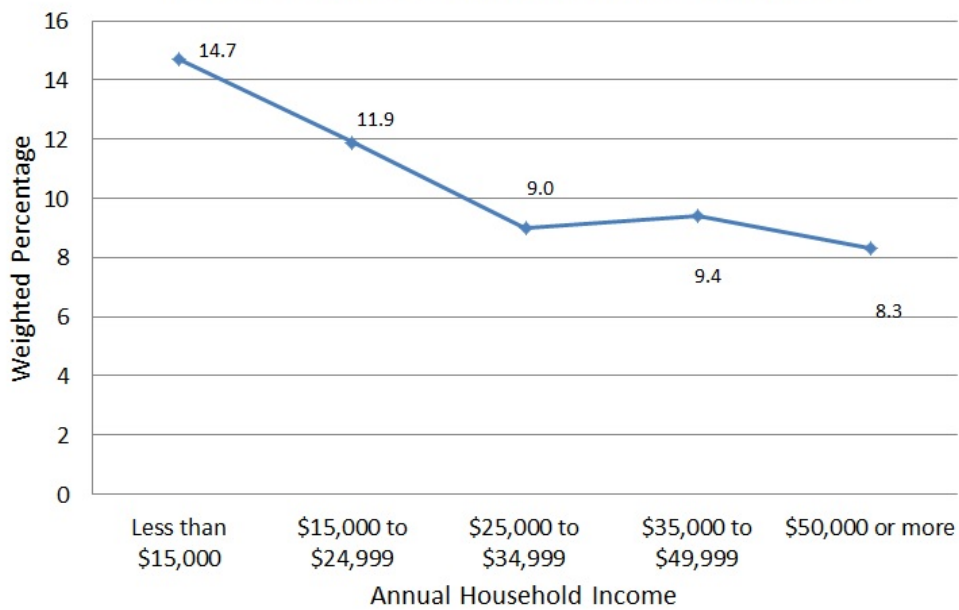
The correlation of disease prevalence and household income holds for adults as well as children. Figures 3 and 4 highlight two chronic diseases of adults, chronic obstructive pulmonary disease (COPD), emphysema, or chronic bronchitis and diabetes. For the pulmonary diseases (Figure 3) there is more than a five-fold difference in prevalence rates from the highest income category to the lowest. The prevalence of diabetes (Figure 4) is twice as high in low-income households as in high-income households. These differences also apply when we switch from chronic physical disorders to behavioral ones. Figure 5 shows the prevalence of diagnosed depressive disorders by household income. Once again, the rate of diagnosis is higher as household income declines. Finally, Figure 6 provides data on obesity, a condition that is associated with the increased risk of developing a number of different diseases ranging from heart disease, to arthritis, to some cancers. Here the slope of the trend line is less steep than in the other graphs presented. Obesity is more evenly spread across income groups. But even here the gradient associating poorer health with smaller income persists.

As stark as this evidence is of income-based health disparities across Kansas, the data presented may *understate* the degree of the disparity. The survey questions for all of the diseases (Figures 2-5) are obtained by asking survey respondents the question: “Has a doctor, nurse, or other health professional EVER told you that you have _____?” Individuals in lower income categories are less likely to have health insurance (including Medicaid), a usual source of care, and access to preventive and screening services. Consequently, a number of them may, in fact, have the diseases reported above, but because they have never been diagnosed with them, they were not counted by BRFSS.

Evolution of the Social Determinants of Health

While there is no doubt that income, education, employment, and other SES indicators are highly correlated with health, correlation does not imply causation. In many cases, the relationship between the two variables, SES and health, is reciprocal: SES affects health *but* health also affects SES. Some view SES as a proxy for the real causes of poor health that give rise to disparities. Focusing on proxy measures alone may not provide an accurate or complete picture. For example, measuring educational attainment does not take into account the quality of the education received or the impact of discrimination or other social factors. For example, African-Americans with high school educations earn one-third less than Whites with the same level of education.

Figure 2
Percent of Children with Current Asthma, 2013



Source: KDHE, BRFSS

Figure 3
Percent Adults Diagnosed with COPD, Emphysema or Chronic Bronchitis, 2013

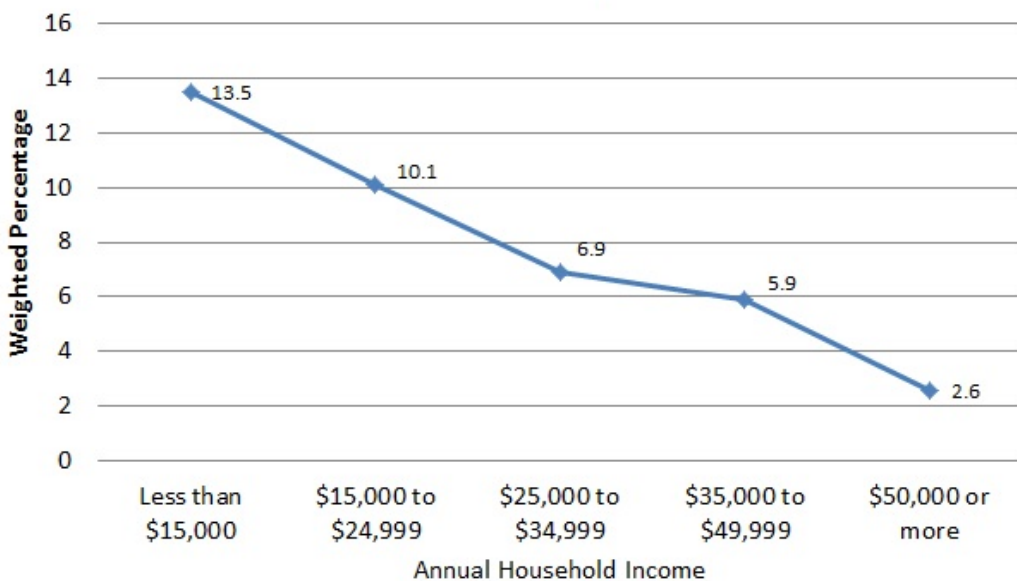
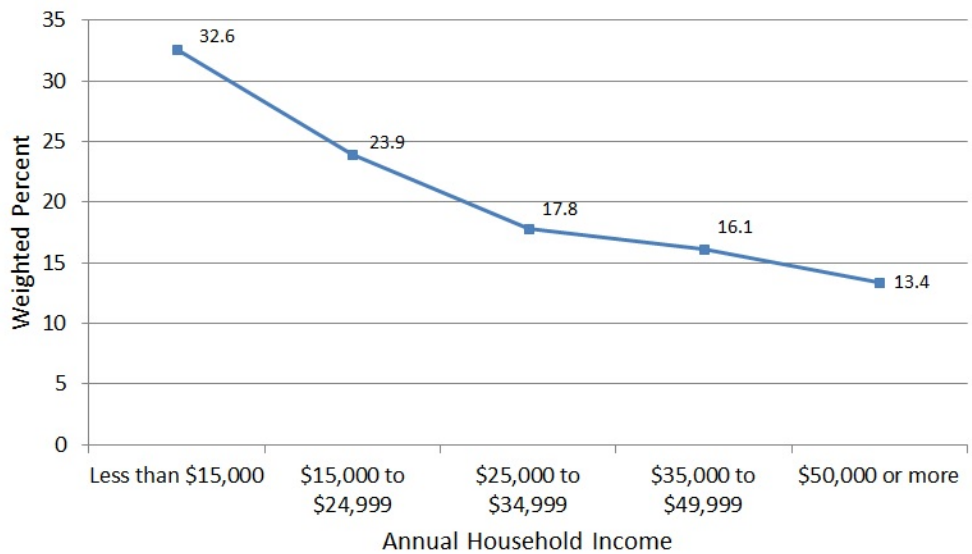
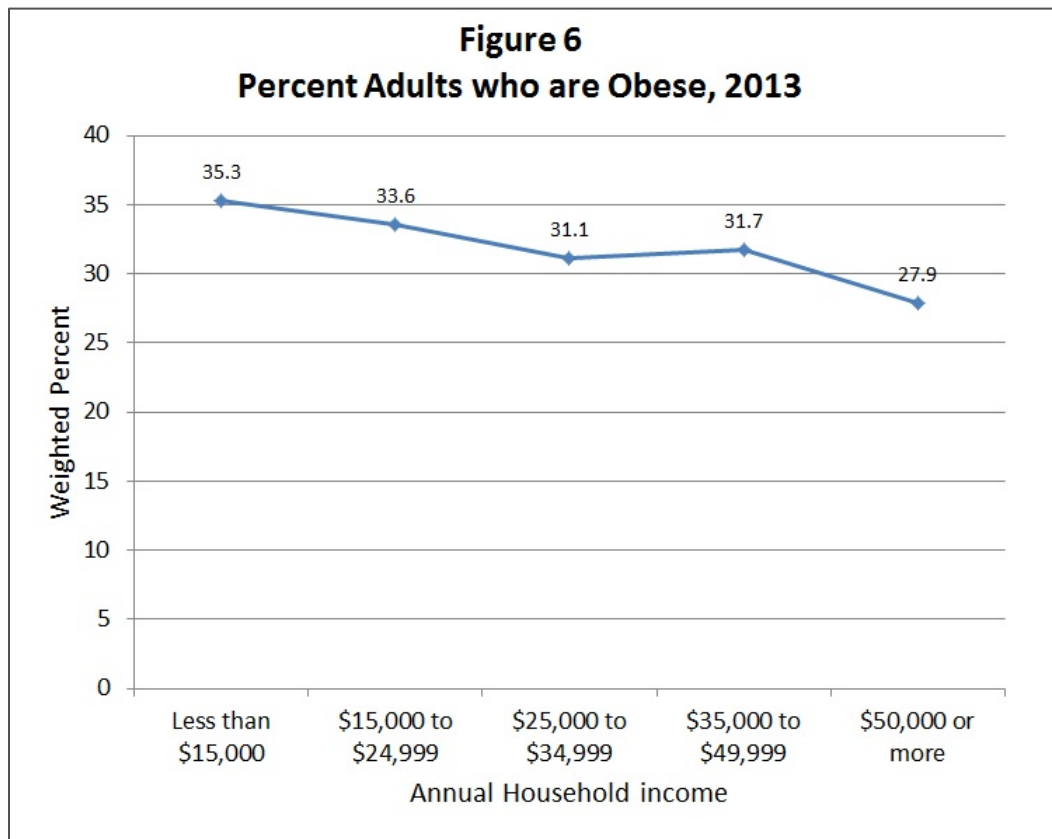


Figure 4
Percent Adults Diagnosed with Diabetes, 2013



Figure 5
Percent Adults EVER diagnosed with a Depressive Disorder, 2013





The same level of poverty can have different effects on the health of individuals depending on neighborhood characteristics, such as the concentration of poverty.

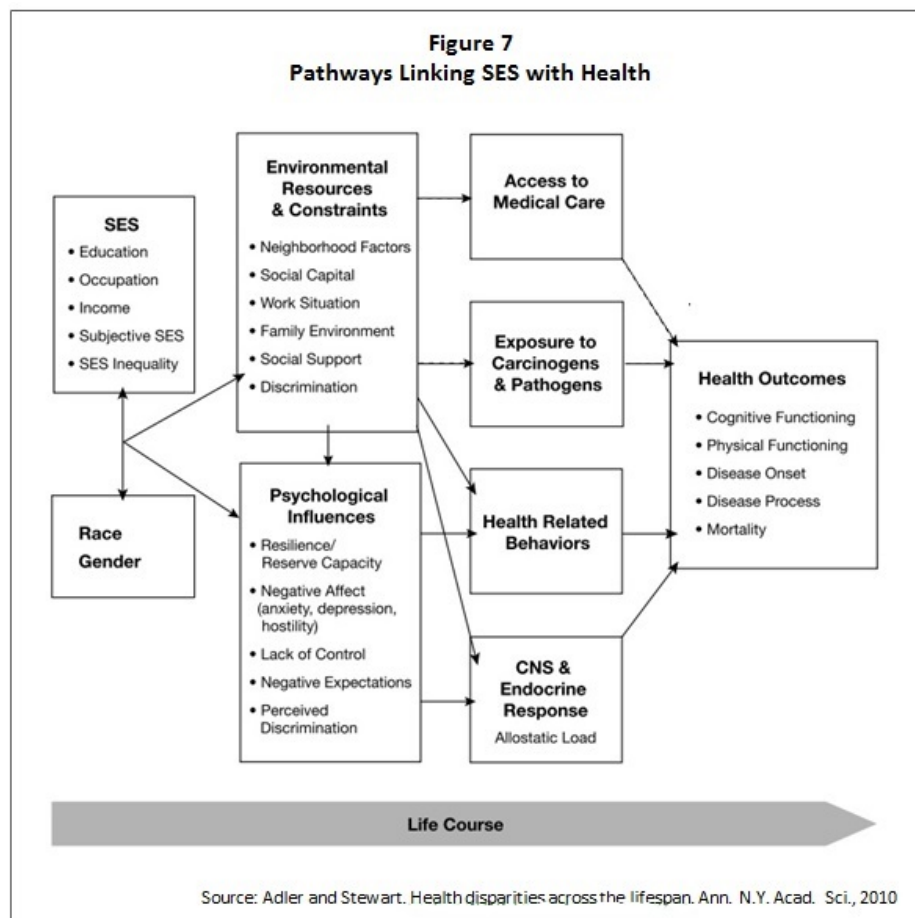
More recently, public health researchers have begun to look more deeply into the “causes of the causes” of poor health. British epidemiologist Sir Michael Marmot, a leading theorist of social determinants of health, defined the “causes of the causes” as “the social conditions that give rise to high risk of non-communicable disease whether acting through unhealthy behaviors or through the effects of impossibly stressful lives.” In other words, to understand health disparities it is necessary to move even farther upstream than SES and ask, “What is it about living in poverty or being poorly educated that negatively affects health? How does SES get under the skin?”

Since the early 1990s when these questions were first asked, we have learned a great deal. But at the same time, the field of health disparities has become substantially more complex and many questions remain unanswered. A brief history of the evolution of thinking on social determinants of health begins in the U.K. The Whitehall studies of the British civil service demonstrated that health disparities occur along a *gradient*, well documented in Figures 2 – 6 above. Previously health comparisons were made between people who were poor and those who were not, as though poverty, however defined, was the threshold for poor health. By the turn of the century attention had shifted to the mechanisms by which SES affects health. Research focused on how SES influenced *biological processes in the body*. At the same time, other researchers were

concentrating on *multiple levels of influence* on health: individuals, families, neighborhoods, and communities. In discussing this multi-level approach, Nancy Adler and Judith Stewart wrote (2010) about the “ecological embeddedness of risk factors for disease that differ by socioeconomic level.” In regard to obesity they continued:

Although described as a personal behavior, one’s ability to eat a healthy diet and to exercise is affected by resources available to the person. The availability and relative cost of healthier foods such as fruits and vegetables varies considerably across communities that vary by SES.

The consequences of these multiple enhancements to social determinants of health theory are depicted in Figure 7. It lays out contemporary thinking about the pathways linking SES and health. (Missing from this model is feedback loops and interaction effects, which would have added more complexity to it.)



Note that SES and race and gender effects influence both *environmental* and *psychological* resources. Environmental resources and constraints are social factors that influence four pathways that are frequently cited as contributing to health disparities: access to health care services, environmental exposures, health behaviors, and biological (central nervous system and endocrine) processes related to stress. The first three of these four pathways appear in earlier

models of the social determinants of health; the fourth pathway CNS and endocrine response is relatively new. Psychological influences are personal and individual. They impact both health behaviors and CNS and endocrine response. Psychological influences such as control beliefs (e.g., self-efficacy, self-esteem, fatalism, and locus of control) are considered determinants of health behavior and health outcomes. They are necessary components in several theories of behavioral change (such as the theory of planned behavior and the theory of reasoned action) leading to health improvement. Control beliefs along with anxiety, hostility, vitality and vigor, optimism/pessimism beliefs and coping strategies can decrease or exacerbate external threats and stressors.

The concept of “allostatic load” was developed by McEwen and Stellar in 1993 to help explain how social factors might affect biological systems. Generally speaking, allostatic load is the biological “wear and tear” that accumulates among people living in disadvantaged circumstances for extended periods. It is defined as “the overtaxing of several physiological systems in response to stress or other psychosocial or behavioral factors, so that dysregulation and possibly disease may develop.” Measures of allostatic load (results from several common laboratory tests) are hypothesized to indicate how well or poorly the cardiovascular, metabolic, nervous, hormonal and immune systems are functioning and suggest greater vulnerability to disease.

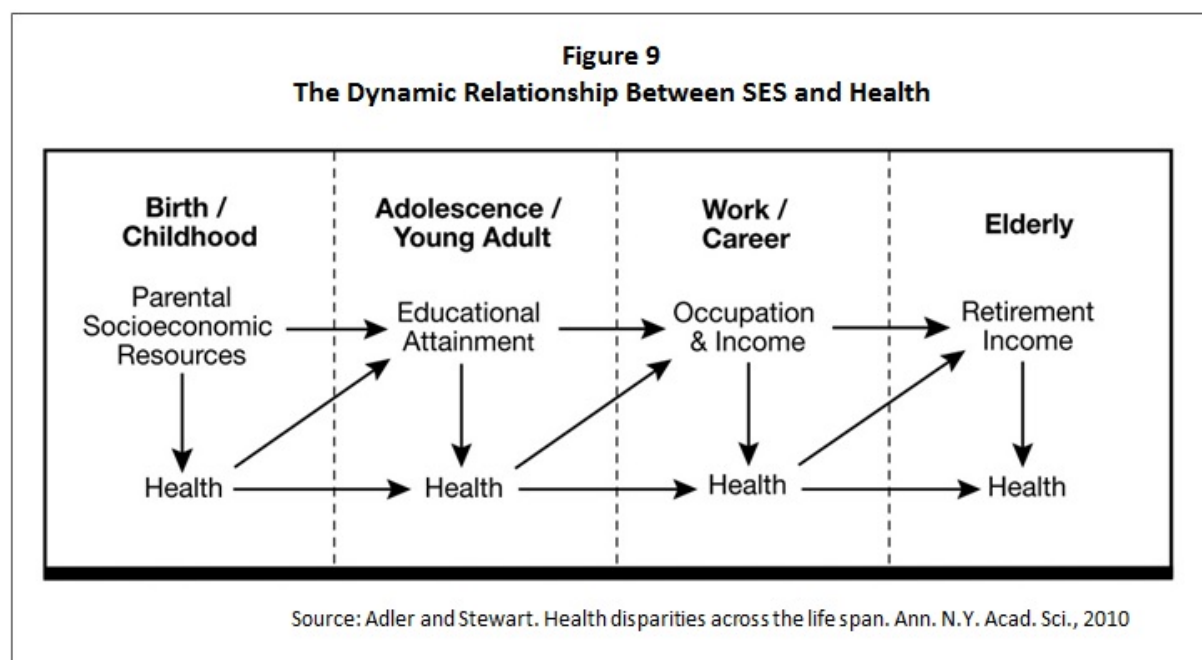
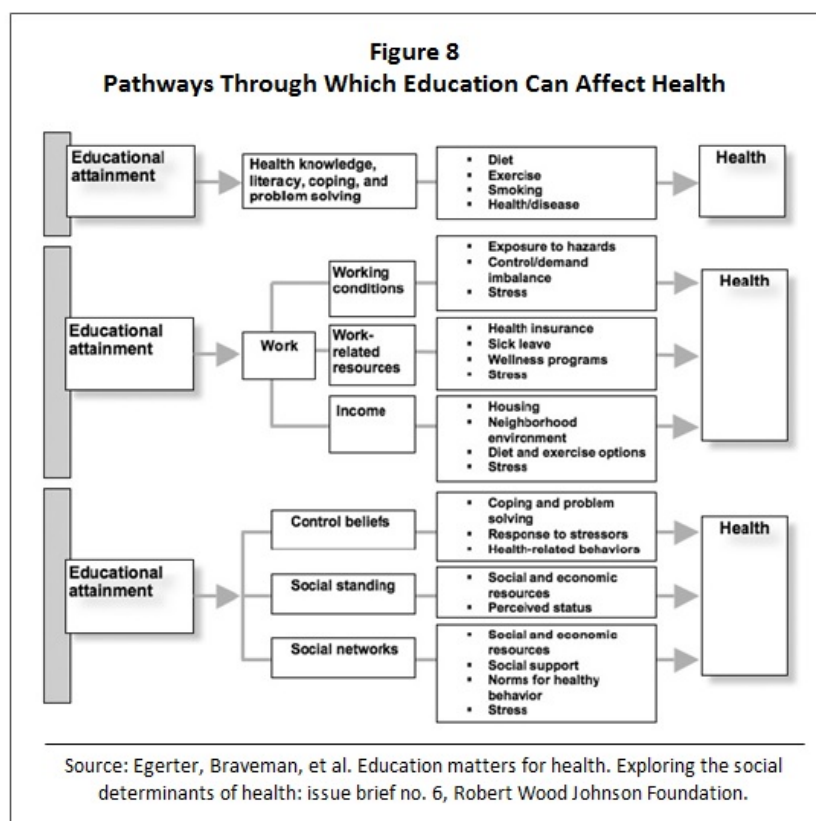
Taken together, the four “adjusted” pathways influence health outcomes. The health outcomes listed in Figure 7 are not simply the absence of disease but comport more closely to the World Health Organization’s definition of health as the “state of complete physical, mental, and social well-being.”

An example of the implicit complexity of this model is found in Figure 8. It presents three pathways through which education can affect health: education as a facilitator of healthier behaviors; education as a pathway to greater work-related resources and income, but also work-related hazards; and education as a factor in regulating psychobiological processes and subjective beliefs about social status and social networks. As complex and multifactorial as Figure 8 is, it is hardly complete; there are other plausible pathways through which education could affect health.

Health Disparities Across the Life Course

Figure 7 also introduces the idea that social determinants influence health across the life course from pre-birth to death. The arrow at the bottom of the figure implies that the pathways depicted operate over time, but because the model does not include feedback loops, it is difficult to assess the impact of time on SES and health. Figure 9 addresses this deficiency. Figure 9 is a model of the *dynamic* and *reciprocal* relationships between SES and health throughout life. The socioeconomic resources of parents affect the health of their children. (This topic will be considered in greater depth later in this paper.) The educational attainments of children are influenced by *both* the socioeconomic resources of parents *and* the child’s personal health. *At this early juncture in life, the conditions are ripe for the intergenerational transmission of poverty.* In each subsequent stage of life, SES influences health and health influences several domains of future SES. For those who begin life poor, there is a cumulative and compounding effect throughout the life course which reduces the trajectory and duration of health

development: they live less healthy lives and die sooner than expected. They are exposed to more risk factors than their more affluent peers and benefit less from protective factors that would shield them from harm.



Children: The health of low-income mothers during pregnancy from causes such as poor nutrition, stress, and exposure to environmental pollution is associated with preterm births and low birthweight. Adverse experiences *in utero* can lead to impaired growth and developmental delays, and possibly adult illnesses. The rate of low-birthweight live births in Wyandotte county is 10 percent greater than the rate for all of Kansas (7.7 percent versus 7.0 percent), but the rate of babies born who are small for their gestational age in Wyandotte County is 34.3 percent above the rate for the entire state (13.3 versus 9.9 percent). Thirty-one percent of babies delivered in Wyandotte County had Prenatal Care Utilization Index scores that were *less than Adequate Plus* or *Adequate*, compared to 18 percent for all of Kansas. (For many of the other birth outcomes reported by KDHE, Wyandotte County is similar to or better than the state averages.)

Poor children are subject to a larger number of physical and psychological stressors than higher-income children. These assaults accumulate over time disrupting normal neurodevelopment that can have a lasting impact on brain structure and the biologic pathways that lead to poorer physical and mental health. The effects of childhood poverty on stress dysregulation are explained by chronic exposure to stressors, their severity, and age at onset. The longer children are in poverty, the greater the risk. The immediate impact of increased stress levels in children is lower levels of self-regulation and coping behavior. Both self-regulation and coping rely on attention control, working memory, inhibitory control, delay of gratification, and planning. Lower-income infants and toddlers are at greater risk for later school failure, learning disabilities, behavior problems, developmental delay, and health problems. Many children who struggle cognitively either act out or shut down (e.g., disengagement, avoidance, and withdrawal).

Other aspects of poverty also affect school performance: Poor children have greater rates of untreated ear infection, that may result in their having trouble discriminating sounds and following instructions and hearing the teacher; it may also harm their ability to read. Children from low-income families hear only one-third as many words by age four as the 46 million words heard by children in upper-income families. A child's vocabulary helps in learning, memory, and cognition. Children who are not familiar with words may be less interested in reading.

Although one's genetic heritage predisposes individuals to certain disease and health outcomes, gene expression is modified by past and present social and physical environments. In other words, the cosmic goodwill bestowed on an individual biologically at birth could be negated by the deprivation, stress, and toxic exposures resulting from social inequities.

The children of low-income immigrants, on average, are born with better health than low-income children of native-born parents, a phenomenon known as the epidemiologic paradox. This paradox of good health despite low socioeconomic status is hypothesized to stem from the selective migration of healthy mothers, or to possible cultural factors that mitigate the more pernicious aspects of socioeconomic deprivation on children, or both. While the epidemiologic paradox is well documented, its endurance across the early developmental stage of these children is less certain. (While many population-based indicators are collected at birth there are far fewer sources of data available for comparison as children age.) One recent study suggests that the

health benefit at birth may be lost by early childhood. Another study shows an increase in the prevalence of many health conditions among Mexican American children across time and generations. This pattern has been referred to as “health assimilation,” which implies a cultural component. It could also be the result of their exposure to the physical and psychological stressors that prey on the children of low-income native-born parents.

Childhood Socioeconomic Impact on Adult Health: Researchers at the MacArthur Foundation Network of SES and Health (University of California at San Francisco) identify two theories for explaining how childhood SES affects adult health. The first is characterized as the *latency model*. It hypothesizes that “critical periods” exist during the development of some organ systems and physiologic processes. For example, poor development of the pancreas is associated with type 2 diabetes; abnormal kidney development may increase the risk of hypertension. Changes that deviate from normal development during these critical periods are irreversible. As a consequence, the physical and social environments experienced by children have lasting impacts on adult health *regardless of the future SES of the adult*. Maternal behavior during pregnancy (poor nutrition, smoking, and teenage pregnancy) is related to low birthweight, which, in turn, is a risk factor for cardiovascular disease in adults.

The second theory postulates that the cumulative effects of multiple *adverse childhood experiences* become biologically embedded in the individual. This theory relies heavily on the notion of allostatic load introduced earlier. *Allostasis* is the ability to achieve stability through change. It is a process used by all humans confronted by social or environmental stressors. But a small price is paid each time the body goes through allostasis to reestablish stable functioning. Because poor children have more socioeconomic and environmental assaults over time they incur more stress-induced wear and tear, greater allostatic load. Higher levels of allostatic load lead to poorer health in adolescents and adulthood. Allostatic load connects a person’s psychosocial environment to disease via neuroendocrine dysfunctions that push the cardiovascular system toward coronary artery disease and hypertension and the endocrine system toward diabetes. This theory is referred to as the *pathway model*.

The concept of adverse childhood events (ACE) as a risk factor for adult disease is relatively new. Since 1995, CDC in partnership with Kaiser Permanente (a large HMO) have been studying the relationship of ACE to adult health status and behavior. ACEs are stressful or traumatic events experienced by children: abuse, neglect and household dysfunction such as witnessing domestic violence, or growing up with substance abuse, mental illness, parental discord, or crime in the home. The impact of ACEs on health is determined by a dose effect-effect relationship: the more exposure to ACEs the greater the impact on health. ACE is measured by an ACE score.

Childhood trauma is very common and spread across all income groups. Eighty-seven percent of the 17,000 patients in the CDC/Kaiser study reported at least one ACE. Nevertheless, economic hardship is the most common adverse childhood experience, and there is a much higher prevalence of ACEs among children living in poverty.

Health development across the life course can be understood as the interaction between the latency model and the pathway model. Both models are dominated by the influence of socioeconomic conditions on the development of health at an early age. Figure 9 illustrates this relationship. In many cases, the latency and pathway models interact not only to make one unhealthy but also poor.

Other Determinants of Health

Race and Ethnicity: In recent years the preponderance of evidence has shifted away from earlier genetic definitions of race to conceptions of race as a social construct with little or no biological basis. In regard to health then, factors inherent to race are *not* responsible for racial patterns in disease distribution; social inequities that drive racial disparities are. This conception is clearly compatible with social determinants of health theory. It takes “race” out of the biology in box in Figure 1 and places it squarely in the socioeconomic environment box where it belongs. Implicitly, this means that racial disparities are less about race than they are racism.

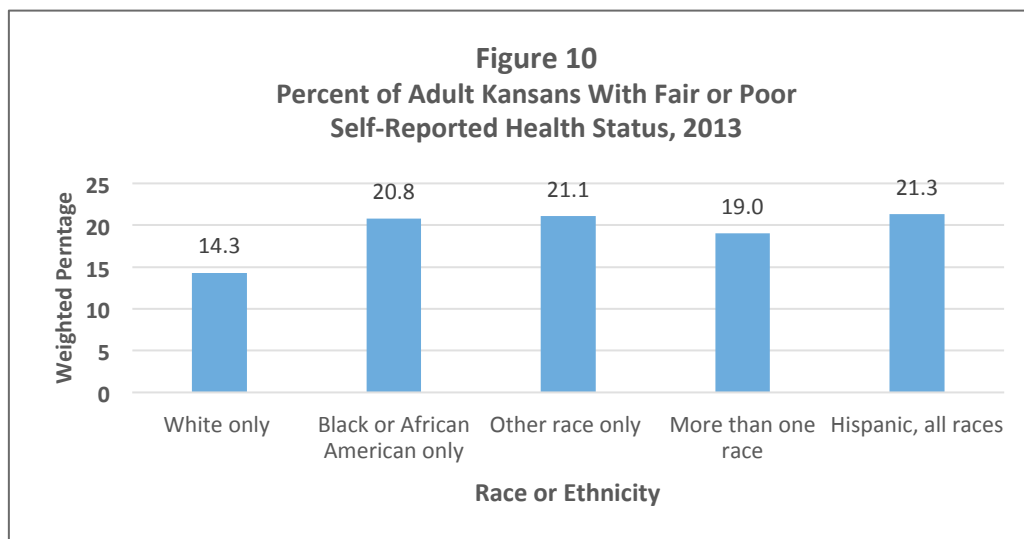
The previous planning paper in this series pointed out the high percentage of Black, Hispanic and other minority residents of Wyandotte County who live below 100 percent of poverty. Most of these poor racial and ethnic minorities live in majority-minority neighborhoods in which health risks (poor housing, limited employment opportunities, greater access to unhealthy foods, tobacco, and alcohol, and industrial pollution) are concentrated, and health-enhancing resources (full-service groceries, outdoor and indoor recreation facilities, and health care providers and pharmacies, and community organizations) are limited. These neighborhood characteristics increase health risks beyond those attributable to the primary SES determinants of income and education. Minority populations with equally low incomes and educational attainments who live in neighborhoods in which poverty is not concentrated fare better than those who live in neighborhoods with high concentrations of poverty.

In addition to stressors associated with the socioeconomic environment, racial and ethnicity-based discrimination is also suggested as a factor associated with health disparities in this group. Intentional, unintentional, and institutional/structural racism and discrimination is a common feature of the lived experience of people of color. The perception of bias among minorities is associated with a number of stress-related conditions: higher blood pressure, sleep disturbance, abdominal fat (a risk factor for metabolic syndrome), high blood sugar, coronary artery calcification, and breast cancer. Blacks have been found to have up to a threefold higher rate of allostatic load than whites. Non-poor Blacks have higher rates than poor Whites.

The lived experience of discrimination is not limited to Blacks and Hispanics. A recent study reported that “everyday” discrimination of Asians is associated with chronic cardiovascular, respiratory, and pain-related conditions. The highest levels of discrimination among Asians were reported by Filipinos.

Racial and ethnic minorities in Kansas report substantially lower levels of self-reported health status. Figure 10 reports the weighted percentages of respondents to the 2013 Behavioral Risk Factor Surveillance System survey who said their health was poor or fair on a five point scale

(excellent, very good, good, fair, or poor). Non-White respondents reported that their health was fair or poor approximately 30 percent more frequently than White respondents.



Neighborhoods: Neighborhoods can be defined by three environments: their biological and chemical environment, their built environment, and their social environment. Characteristics of each of these environments affect health within neighborhoods, and each of the environments are influenced by the income level of its residents. In general, neighborhood health risks increase as the income of the neighborhood declines. Table 1 describes neighborhood characteristics, health risk factors, and health effects for each of three environments within neighborhoods. In addition to these examples, social and economic features of neighborhoods have been specifically linked to mortality, health status, disability, birth outcomes, health behaviors, mental health, injuries, and other health indicators.

As awareness of neighborhood effects has grown, some researchers have asked whether the effects on health are due to the characteristics of the people who live in the neighborhood rather than to the neighborhood itself. This is a question that has not yet been fully answered. Several studies have found, however, that neighborhood effects on health continue to hold even after individual characteristics are taken into consideration. For example, one study of residents of different neighborhoods whose socioeconomic profiles were similar found that individuals in more disadvantaged neighborhoods were more likely to develop heart disease than those living in more advantaged neighborhoods.

A recent study by Kansas and Missouri investigators using data from the Kansas City metropolitan area (21 randomly selected census block-groups from a stratified sample) published in the *International Journal of Environmental Research and Public Health Research* (2015) found that, among men, negative perceptions of neighborhood infrastructure were significant predictors of smoking and binge drinking. For women, no perceived neighborhood environmental factors were associated with smoking or drinking.

Table 1 Neighborhood Characteristics, Health Risk Factors, and Health Effects		
Neighborhood Characteristics	Health Risk Factors	Health Effects
<u>Biological/Chemical Environment</u> <ul style="list-style-type: none"> • Air • Water • Soil 	<ul style="list-style-type: none"> • Air and water pollution • Noise • Waste • Lead paint • Other environmental hazards 	<ul style="list-style-type: none"> • Respiratory diseases • Hearing loss • Anxiety • Sleep deprivation • Developmental delays • Impaired cognition
<u>Built Environment</u> <ul style="list-style-type: none"> • Housing • Transportation • Commercial establishments • Billboards • Parks • Libraries 	<ul style="list-style-type: none"> • Housing-related environmental toxins • Allergens • Inadequate access to healthy foods • Increased exposure to fast food, alcohol, and tobacco • Exposure to tobacco smoke • Lack of recreation 	<ul style="list-style-type: none"> • Asthma • Obesity • Alcohol and tobacco addiction (leading to liver, lung, and cardiovascular disease) • Hypertension (due to obesity and lack of exercise) • Compromised immune system
<u>Social Environment</u> <ul style="list-style-type: none"> • Levels of neighborhood stress and support • Enforcement of common rules for public behavior • Behavioral norms 	<ul style="list-style-type: none"> • Violence • Crime • Social isolation • Low levels of interpersonal trust • Public disorder 	<ul style="list-style-type: none"> • Anxiety • Fear • Hyper-vigilance • Depression • Stress-related behavior (overeating, smoking, addiction)

Source: N. Adler, et al. Reaching for a healthier life, MacArthur Research Network on SES & Health, 2007.

Violence and crime affects health on several levels. Although violence occurs across the socioeconomic spectrum, it is not randomly distributed. It occurs more frequently in low SES populations. In areas where the concentration of low SES residents is higher, the rates of violence and crime are higher. The direct health effects of violence and crime are noted in the “Social Environment” section of Table 1. Violence can also influence health indirectly through the negative impact it has on social and economic conditions in communities. Violence may act as a deterrent to economic development. Businesses may be reluctant to open in unsafe communities regardless of the potential local demand for goods and services. As a result, fewer jobs are available within the community that might be open to local residents. Full-service supermarkets and drug stores are less likely to operate in high-crime areas, reducing residents’ access to fresh and healthy foods and prescription drugs. Violence, then, indirectly contributes to poorer health and greater social disadvantage which in turn can promote greater violence.

The Kansas Bureau of Investigation (KBI) Crime Index for 2013 reports that Kansas has a Violent Crime Offenses Rate of 3.2 per 1,000 residents; the rate for Wyandotte County is 5.0. The population of Wyandotte County accounts for 5.4 percent of the population of the state, but it is responsible for 24.2 percent of all murders in the state, 7.9 percent of all rapes, 18.6 percent of all robberies, and 6.2 percent of all aggregated assault and battery charges.

Behavior: In 2004, Mokdad, Marks, Stroup, and Gerberding published a much-cited article (4,682 times!) in the *Journal of the American Medical Association (JAMA)* called “Actual Causes of Death in the United States, 2000” in which they claimed that “modifiable behavioral risk factors are leading causes of mortality in the United States.” They argued that personal health behavior was responsible for 48.2 percent of all deaths in the U.S. in 2000, led by tobacco (18.1 percent), poor diet and physical activity (16.6), and alcohol consumption (3.5 percent). These deaths could be attributed to largely *preventable* behaviors and exposures. Health-damaging behavior is more common among low SES populations than among higher SES populations and *accounts for approximately one-quarter of SES disparities in health*.

The age-adjusted death rate in Wyandotte County in 2013 was 9.1 (per 1,000 population); the rate for all of Kansas was 7.8. The average age at death in Wyandotte County was 4.7 years lower than the average for all of Kansas (69.7 years versus 74.4 years). As dispiriting as these statistics are, they tell only part of the story. Another epidemiologic indicator is years of potential life lost (YPLL). YPLL takes into account both the age at which death occurs and the frequency of deaths. It measures and totals the number of years of life lost by each death occurring before life expectancy. In 2013, the years of potential life lost before the age of 75 per 100,000 population (age adjusted) in Wyandotte County was 10,125 years. In all of Kansas the YPLL was 6,871 years. Many of these deaths could have been prevented by changes in health behavior. In Wyandotte County, too many people are dying too young.

Since the primary emphasis of public health shifted from communicable disease control to chronic (non-communicable) disease prevention in the 1970s, most efforts to improve health-related behaviors have focused on providing information to individuals and encouraging them to change their behaviors. These efforts have been only marginally successful throughout the population, but have been least successful among low-SES populations. The lack of adoption of preventive health behaviors among this population is not simply a question of lack of will, moral failure, or even poor choices. The truth is more complicated.

Writing in the *Annual Review of Sociology* in 2010, Pampel, Krueger, and Denny identified nine distinct currents of thinking that explain socioeconomic disparities in health behavior. Each of these schools of thought is buttressed by public health research, although in several cases the evidence is less than conclusive and results among studies vary. Each of the nine is explained in the sections below.

Deprivation, Inequality, and Stress: In an earlier section of this paper, the roles that deprivation, inequality, and discrimination play in the development of larger levels of stress, and the

subsequent biochemical impact of stress on risk factors and disease were discussed. Although the biochemical effect of stress on health may be largely indiscernible to those who suffer from stress, the emotional, physical, cognitive, and behavioral symptoms they experience on a daily basis are not. Some investigators suggest that smoking, overeating, and inactivity may be viewed as pleasurable activities that help those experiencing stress to relax and regulate their moods, a form of self-medication. An extension of this thinking suggests that, over time, stress can trigger compulsive behaviors such as smoking, drinking and overeating.

Attitudes Toward the Benefits of Healthy Behavior: Across social science and health disciplines there is consensus that lower-SES groups believe they have fewer reasons for investing in activities that promote longevity than in focusing on present-day decisions regarding health behaviors. A corollary of this explanation suggests that because lower-SES individuals may feel more fatalistic about their ability to alter their circumstances, they may believe they have little to gain by changing behaviors to promote longevity.

Latent Traits: This theory embraced by some psychologists and criminologists, argues that poor parental socialization and other social factors often associated with lower SES lead in some individuals to the development of potentially harmful personality traits such as poor self-control and attraction to risk that have a negative effect on health. These traits might be unconscious or dormant (i.e., latent) but they may be able to be expressed under the “right” circumstances. Latent traits, the proponents argue, are related to addictive or compulsive behavior and failure to adhere to health improvement regimens.

Class Distinction: This explanation of SES-related health behavior disparities has less to with the behavior of low-SES populations than high-SES populations. It holds that high-SES groups may adopt healthier behaviors as a means of setting themselves apart from lower SES groups. Nevertheless, the behavior of high-SES populations, and the subsequent better health resulting from it, creates a discernable disparity with lower SES groups.

Lack of Knowledge and Access to Information About Health Risks: Individuals with lower levels of education may have limited knowledge of the harm of unhealthy behaviors. Because they are more likely to work in jobs without health insurance benefits, they may have less exposure to information about preventive activities coming from either a primary care provider or the insurance company itself. Even in cases where some of the health risks may be known, as in the case of smoking and obesity, they may rationalize their behavior by minimizing the risk.

Efficacy and Agency: Self-efficacy and agency are the cornerstones of several theories of health promotion and behavior change. “Self-efficacy” is belief in one’s ability to complete tasks and achieve goals. It is closely associated with the notion of “locus of control” which refers to the extent to which an individual believes that her or his life is controlled internally by the individual or externally by factors the individual cannot influence. “Agency” is the capacity of a person to act; sociologists suggest that agency implies that the individual is engaging with the social structure. At the root of agency is the capacity of people to make choices. Choosing among

alternatives implies the ability to process information and problem-solve. Together, self-efficacy and agency enable an individual to recognize the need to take steps to overcome barriers to better health and provide the conviction that the actions one takes matter. Individuals with less education who work in positions without much freedom of action and who suffer from lifelong discrimination tend to have lower levels of self-efficacy and agency.

Access to and Availability of Health Behavior Aids: Aids or supports to improve health behaviors are not available to many low-SES populations. For example, access to smoking cessation aids (nicotine replacements or pharmacotherapy) and fitness clubs and weight loss programs is limited because of cost. Availability of healthy fresh foods is limited in many low-SES neighborhoods. Even when full-service grocery stores are available, the ability to purchase more expensive fruits, vegetables, meats, and other healthy foods may be limited by income.

Neighborhood Effects: Neighborhood effects were already discussed above. In addition to the neighborhood characteristics cited in Table 1, it is important to note that marketers of tobacco products and alcoholic beverages intentionally target low-income communities for outdoor advertising. Real and perceived barriers to healthy behaviors result from neighborhood effects. Even when residents of low-SES neighborhoods in a community have *greater* access to recreational facilities than residents of higher SES neighborhoods, low-SES residents report lower perceptions of access to recreational facilities.

Social Support, Social Cohesion, and Peer Influence: Pampel, Krueger, and Denny make a distinction between neighborhood effects and the impact of networks of relatives and friends on health. While neighborhood effects on health have been noted by several researchers and are clearly related to the SES of residents, the evidence in regard to social networks and social capital is more ambiguous. While it is evident that family members, other relatives, friends, and neighbors can support health improvement efforts in several ways (e.g., supporting healthy behavior and sanctioning unhealthy behavior; providing information and other resources to assist individuals to change health behavior) there is also conflicting evidence that shows that similar social networks can promote negative behaviors (especially smoking, drinking, drug use, and overeating). Conclusive evidence is lacking of a clear association between SES and the type and degree of influence social networks have on members. At best, researchers merely claim that high-SES social networks tend to promote healthy behaviors more frequently, and that in contrast to them, all other networks perform less well.

Vulnerability and Resilience: We tend to think of the impact of social determinants of health on individuals as deterministic, when it is, in fact, probabilistic. Social determinants at the individual level may be considered risk factors. Low-SES populations and the people who comprise them are more vulnerable to disease than higher-SES populations: they are more susceptible to harm. The degree to which harm actually occurs is the result of a wide variety of interactive factors, some of which are unknown at this time. Clearly though, not everyone who is exposed to risk factors has the same poor outcome.

Epidemiology currently does not fully explain the factors and mechanisms that protect some individuals in a population who are exposed to significant health risks. Even so, health is recognized as the product of risk factors *and* protective factors that influence bio-behavioral regulatory systems. *Resilience* has been identified as a powerful protective factor. “Resilience” can be defined as the ability to bounce back, recover from, or cope with misfortune or change. Resilience is an instrument with which to combat or overcome the stress associated with low socioeconomic status. By reducing the impact of stress on the mind and body, resilience helps manage the allostatic load that is highly predictive of later-life morbidity and mortality. Resilience is not an innate characteristic; it is the result of the skills, abilities, knowledge, and insights individuals acquire over time to maintain competent functioning in the face of adversity. Although the factors that enable resilience are usually acquired in social settings, they can also be taught to children and adults alike.

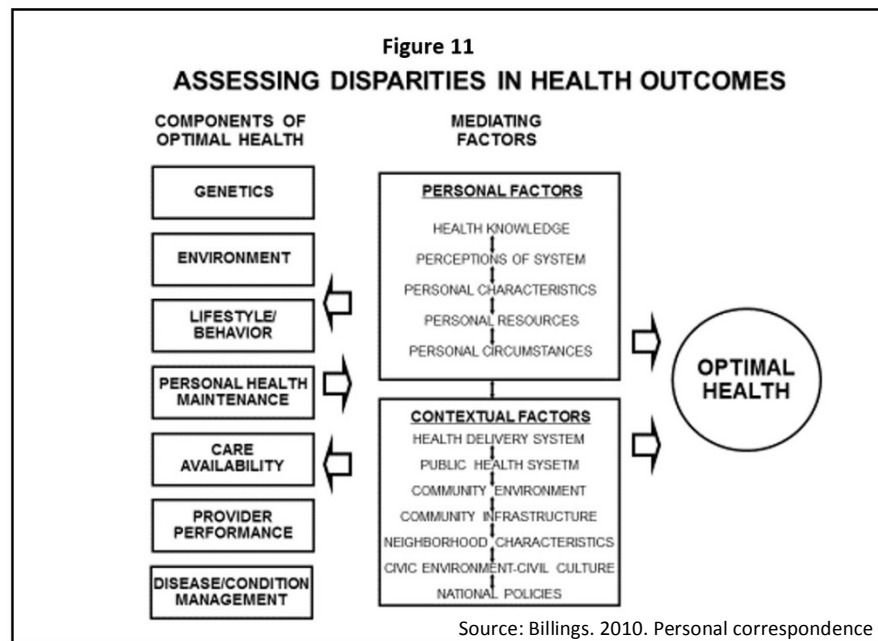
The key characteristics of resilient children are 1) strong feelings of self-esteem and self-efficacy, 2) systematic problem-solving skills, and 3) the ability to recognize and describe their feelings to an adult. Sources of resilience for children include breast feeding; parental beliefs and behaviors that promote self-esteem; social support and support from other adults; and the quality of the home learning environment. It is important to note that poor children who are more resilient may still require additional supports to overcome their disadvantages and bring them into parity with their more well-off contemporaries.

Mediating Factors and Capability

The discussion thus far has focused on social determinants of health on a population level. John Billings has taken many of the concepts discussed above and applied them to individuals in a clinical context (see Figure 11). He refers to the determinants of health as the “components of optimal health.” He places *mediating factors* between the components of optimal health and optimal health itself. “Mediating factors” are the psychological and social conditions that moderate the effects of the components of optimal health either positively or negatively. In his conception, the determinants of health can be reinforced by mediating factors or undermined by them. It is important to note that Billings use the term “optimal health” rather than some vague notion of ideal health that applies to everyone. Optimal health is specific to the components of optimal health possessed by each individual. In other words, one can only obtain the level of health allowed by one’s own determinants of health. However, the effects of one’s personal determinants of health, as it were, can be mitigated by one’s mediating factors. In other words, the situation can be viewed in this way: social determinants are the cards you are dealt; mediating factors are the way you play your hand.

The mediating factors are divided into two groups, personal factors and contextual factors. Table 2 lists examples of each of the personal mediating factors. Two factors on this table are deserving of additional comment. First, perceptions of the health system highlights the fact that beliefs count as much as facts when people assess barriers to the health care system. Acceptability is one of five dimensions of access in the classic Penchansky and Thomas model

of health care access. (The others are availability, accessibility, accommodation, and affordability.) Client attitudes about personal and practice characteristics of providers affect their willingness to use services. It is important to note that acceptability barriers continue to exist even when individuals have health insurance. Poor patient-provider interactions, regardless of the cause, too often result in poor quality care because of: poor communication; different beliefs about illness and treatment; poor adherence to therapeutic plans; limited health literacy; and provider bias and stereotypes.



Second, personal characteristics emphasize the importance of *basic capabilities* that allow the individual to manage her own health and condition, assuming she has one or more. Before one can improve one's health one must believe that the action she takes will affect the outcome. In order to take action, one must be able to identify expectations based on health beliefs and be motivated to act. As common as these characteristics are in higher-SES populations, many lower-SES individuals have never learned or been exposed to these beliefs. In many cases, these beliefs are not part of the culture.

Table 3 lists selected contextual mediating factors and provides examples for each one. These factors set the framework for any of the personal factors.

Capability: “Capability” is a word that has crept into discussions of poverty and human development with increasing frequency in the past 20 years or so, but it still is not widely discussed in regard to health. According to the *Inequalities Dictionary* of the Stanford Center for the Study of Poverty and Inequality, “capability” means “measured and unmeasured skills.”

Nobel laureate Amartya Sen pioneered what is referred to as the “Capability Approach,” which has been applied to poverty programs across the globe. Unfortunately, the capability approach

Table 2 Mediating Factors: Personal	
Mediating Factors	Examples
Health knowledge	<ul style="list-style-type: none"> • Health habits • Symptom identification • Self-management • Resource availability • System navigation
Perceptions of health system	<ul style="list-style-type: none"> • What services exist • Wait times • Respect afforded • Communication effectiveness: language • Communication effectiveness: listening • Cultural sensitivity • Expectation of payment
Personal characteristics	<ul style="list-style-type: none"> • Health beliefs • Self-efficacy • Expectations • Self-advocacy • Attitudes towards risk • Attitudes towards benefit • Motivation • Confidence • Mental health • Stoicism
Personal resources	<ul style="list-style-type: none"> • Health Insurance • Income • Skills/Education • Social Capital: Personal
Personal circumstances	<ul style="list-style-type: none"> • Life demands • Competing priorities • Stress • Employment

(CA) is very complex, uses terms with specific meanings that are contrary to their use in common parlance, and is described by its creator and others as a flexible and multi-purpose framework, rather than a precise theory of well-being. To the extent that it can be considered a theory, it is a normative rather than an explanatory theory: it does not explain poverty and well-being; it is merely a way to conceptualize notions about poverty and well-being. So, why all the fuss? It conceives of poverty as not merely (or even primarily) the deprivation of income but as the deprivation of capabilities that allow individuals *through their own agency* to achieve the

Table 3 Mediating Factors: Contextual	
Mediating Factors	Examples
Community Environment	<ul style="list-style-type: none"> • State/Local economy • Housing stock • Crime rates
Neighborhood Characteristics	<ul style="list-style-type: none"> • Collective efficacy • Availability of community and commercial resources • Leadership
Civic environment/ civic culture	<ul style="list-style-type: none"> • Political environment/will • Racial/ethnic/economic segregation • Social cohesion • Expectations of institutions • Willingness/capacity for innovation • Willingness/capacity for cooperative action • Public/private relationships

things they value. Because most people would rather enjoy the comforts that sufficient income provides to them and their families, it is something that most people would value. Poor people, however, are not able to achieve what they value because of deprivation of capabilities. These deprivations may be due to social or institutional causes, but they all apply at the individual level. CA continues with the insight that some low-income individuals are not able to acquire the capabilities that will allow them to achieve their goals because they have not yet acquired certain *basic capabilities*. “Capabilities” refer to a very broad range of opportunities; “basic capabilities” are certain elementary and crucially important attributes that allow individuals to achieve higher-level capabilities.

Health Capability: A small number of academics, notably Jennifer Prah Ruger at the University of Pennsylvania and Peter A. Hall and Rosemary C.R. Taylor at Harvard University, have begun to apply CA to health, specifically as it affects low-SES populations. Ruger coined the term “health capability” and says of it, “Conceptually, health capability enables us to understand the conditions that facilitate and barriers that impede health and the ability to make health choices.” In her conception, health capability is composed of elements that are internal and external to the individual, similar to Billings’ personal and contextual mediating factors. Ruger defines “capability” as “an ability or power to perform with the potential for achieving desired ends.” The internal foundation of health capability “requires self-management, self-governance, and confidence in one’s ability to achieve health goals. Furthermore, it entails the ability to take responsibility for acquiring the information, knowledge, and skills necessary for good health.”

Although Ruger doesn't make an explicit distinction between capabilities and basic capabilities, many of the examples she gives of capabilities are what others CA proponents would characterize as basic capabilities. The external foundations of health capability identify the cultural, social capital, SES, health care system, and public health system factors that improve or impeded the exercise of health agency.

Ruger says that her health capability framework can be used to help answer questions such as: "Why is it so difficult for some populations or individuals to translate health resources into health outcomes? Why have health literacy efforts been only moderately successful? Why do some individuals have such difficulty adhering to treatment regimens? Why are some individuals harmed or helped by cultural norms about health behaviors?" These questions and many others like them resemble the many questions asked explicitly or implicitly throughout this paper.

Hall and Taylor similarly argue that "people's health is affected by capacities for coping with life challenges [i.e., capability] that depend on the character of the institutional and cultural frames [i.e., external factors] in which they live." They suggest that the "wear and tear" that precedes ill health depends on the balance between the magnitude of life challenges facing a person and her capabilities for responding to them. "As the life challenges facing a person loom larger relative to his or her capabilities for coping with them," they suggest, "we expect that person to experience higher levels of wear and tear in daily life, feeding into feelings of stress, anger, anxiety, and depression that take a toll on health." Hall and Taylor view capability as "basic attributes of personality associated with reflective consciousness and emotional resilience," augmented by the ability to exploit an external range of social resources that can be used to resolve life's problems. In many ways, they hypothesize health capability as the interplay of vulnerability and resilience.

Like Sen before them, Ruger, Hall and Taylor have done little to operationalize their capability frameworks. They provide a lens through which to view poverty and ill health, but they do not point to specific interventions that might improve health among disadvantaged persons. To many this is a virtue: it invites others to flesh out the details of the framework. Lacking rigorous evidence, however, most public health researchers have failed to push forward, continuing to embrace solutions that focus too narrowly on the allocation of material and financial resources. In contrast, Paula A. Braveman, a prominent social determinants of health researcher and long-time RWJF grantee, called the question in the title of her 2011 article in the *American Journal of Preventive Medicine*: "When do we know enough to recommend action on the social determinants of health?" Braveman and her colleagues argued for acting responsibly in the face of uncertainty:

Rather than pursuing certainty, the preferred goal is to identify and apply the best available knowledge, with full awareness and acknowledgement of its limitations...In an ideal world, all policies – current and future – would be supported by a sound base of scientific evidence. In reality, in most situations, including ones in which experimental

results are available, decisions affecting health must be made on less-than-certain knowledge.

The Case for Taking Action

In response to Paula Braveman's question, the answer is, "Now!" Let me review the case. The association between SES and health is clear and holds up in case after case. The strength of these associations is so powerful that most supporters implicitly embrace the notion that the only means of improving human health and well-being is through economic growth and/or wealth redistribution. The social determinants literature by and large does not suggest principles for systematically assessing whether interventions are needed to improve health among low-SES populations beyond those that reduce income inequality. One reason for this is because research on the effectiveness of particular interventions is difficult given the ethical problems associated with randomizing interventions related to disadvantaged populations. As a consequence we know very little about how social determinants interventions might actually work. For example, at its most basic level, we know that socially disadvantaged individuals have poorer health, but we do not know if socially disadvantaged individuals would have better health if they were to become advantaged.

Because of work in the last 20 years focusing on the psychobiologic pathways from SES to disease we have been able to identify some of the causes of the causes embedded in social determinants theory. They come down to only a few causes, primarily unhealthy behaviors, the perinatal behavior of mothers, and stress. But each of these causes, in turn, has its own causes as well. We know what some of them are too: several of them have been enumerated above. In fact, we already know a good deal, enough one could argue that systematic *community-based interventions* that seek to interrupt some of the primary pathways to poor health experienced by the poor should have been designed and implemented by now. But they have not. On the other hand, *clinical interventions* focusing on issues such as self-efficacy, patient-provider communication, stress-reduction, and so on, have proven in repeated randomized clinical trials to improve the health of *patients already diagnosed with specific diseases* and to reduce their use of health care services.*

* Two primary examples of clinical interventions based on basic capability development are the Chronic Disease Self-Management Program (CDSMP) and patient activation research. Developed at Stanford University by Kate Lorig and others, CDSMP features a workshop of 2.5 hour per week for six weeks. People with *different* chronic diseases referred by a physician attend. Classes are taught by two trained leaders (the leaders do not have to be health professionals and frequently are persons with chronic diseases themselves). Topics include communication, self-efficacy, stress-management, and symptom management. CDSMP material has been translated into 24 languages and culturally appropriate versions have been designed for Africa-Americans, Latinos, and American Indians. It has been the subject of over 50 published research studies. Following the six-week workshop health usually improves, health utilization sometimes declines, and the improvements appear to be enduring. CDSMP has been endorsed by KDHE which trains workshop leaders. The second example is patient activation studies. "Patient activation" describes the knowledge, skills and confidence a person has in managing their own health and health care. Most patient activation research has been conducted by Judith Hibbard at the University of Oregon who has developed a 13-item Patient Activation Measure (PAM) which is marketed by a private firm. Individuals with higher activation scores engage in more preventive behaviors, healthy behaviors, disease-specific behaviors,

Following the dictum of Braveman and colleagues to act responsibly in the face of uncertainty and acknowledging the low-risk to community residents of participating in these behavioral interventions, it seems to be a reasonable approach for the Wyandotte Health Foundation to ***fund a variety of basic capability development programs at the community level intended to improve health agency***. Because the basic capabilities that promote health agency are also known to improve social functioning, complementary benefits may also accrue to the individual beyond the domain of health and well-being. Specifically, enhancements to the capability of some low-income residents of Wyandotte County might:

- Improve their health and well-being allowing them to optimize their social functioning (e.g., work and study, personal and social relationships, self-care, community engagement).
- Improve the current and future health and well-being of their children (e.g., prenatal behavior, reduce adverse childhood experiences)
- Possibly begin to break the cycle of poverty (e.g., improving childhood health and health across the life span, expanding educational attainment, attaining more lucrative employment, carrying forward capabilities to future generations)

Who, What, and Where?

Given the limited philanthropic resources available for investment, some setting of priorities is advisable to achieve the maximum return in terms of improved population health. Although some individuals throughout the SES spectrum may be able to benefit from basic capability development programs, people in greatest need are on the lower rungs of the SES ladder. From a strictly administrative perspective, it is also easier to organize and manage programs when the target population achieves a critical mass within a limited geographical area, such as a neighborhood.

Children would appear to be the highest priority group. In Wyandotte County, the group with the highest poverty rate is children. Keeping them healthy makes a contribution to their ability to prosper in school, and protecting them from avoidable adverse childhood events helps insulate them from neuroendocrine dysfunctions that can result in disease and disability across the life course. Because of the intricate dance between health and wealth, keeping children healthy also lowers the probability that they will be poor as adults. The problem is that there are limited access points to children that do not go through their families. By the time interventions are available to reach children in social settings like schools it may be too late. They have to be touched by interventions earlier in life. This suggests that the first priority may be mothers. Mothers will clearly benefit from basic capability development programs and pass the benefits (and later the lessons) of these programs on to their children. It is analogous in some ways to the

and health-seeking behaviors. Studies have shown that patient activation is a skill than can be taught and that patients who start with the lowest activation scores tend to increase their scores the most. The National Health Service of the UK is assessing participation in patient activation programs.

request of the airlines that in the case of a loss of cabin pressure, you secure your own oxygen mask before assisting others.

The substantial low-SES immigrant community in Wyandotte County suggests that programming may have to take place in languages other than English. The availability of potential grantees that are able to design and implement culturally appropriate basic capability development programs may affect the ability to roll-out programs to some high-priority populations.

It may be presumptuous at this point to suggest the specific types of program and grantees that might be funded through an approach that focuses on health capability enhancement. All programs and organizations that boost the health agency and resilience of low-SES residents of Wyandotte County should be considered. It is hoped that potential grantees would offer innovations that stimulate activity in this arena. All of the interventions should have some relationship to evidence. The behaviors and beliefs that are connected to health agency and resilience are not new and have been the subject of psychological and other social science research for years. Both reliability and validity of metrics and methods have been established. Logic models and theories of change are less important here because of the deep and wide trail of empirical evidence that exists.

The highest-risk residents of Wyandotte County live in a relatively small number of neighborhoods on the eastern side of Kansas City, Kansas. In these neighborhoods, poverty is more highly concentrated and neighborhood health effects are more profoundly evident. It would appear that focusing basic capability development programs in these neighborhoods would have the most benefit. Other health programs related to the built environment, chronic disease prevention and health promotion, and health care delivery funded by the Wyandotte Health Foundation, other philanthropies, or civic organizations may complement and reinforce the health capability messages. Embedding these programs in the most vulnerable neighborhoods may lead to greater social cohesion/social capital, willingness to cooperate, and collective efficacy. On the other hand, the social norms of the neighborhoods may be so at odds with the behaviors and beliefs being taught in the programs that they undermine their ability to take root and grow. These setting issues, as well as ones concerning the target audiences and program criteria, will need to be considered more fully if the Wyandotte Health Foundation moves forward with the idea of basic capability enhancement.

Caveats

Certain potential limitations to this approach should be noted. While these ideas are not new and the concepts have been proven to be effective in clinical settings among patients with diagnosed conditions, I am unaware of community-based programs that attempt to develop basic capabilities as a precursor to acquiring better health behaviors, absent a diagnosed condition. The anticipated changes in behaviors and beliefs among the community groups may be less than in clinical groups, or may not exist at all. Also, the existence of a disease state may reinforce

behavior in the clinical group making changes in behavior more enduring, i.e., the rewards for behavior change are more immediate.

It is worth noting that although these programs are community-based with the intention of improving population health among low-SES residents, the interventions will take place at the level of the individual. That means that it might take some time for the population effects to be discernable, assuming that positive changes can be detected.

These potential limitations must be weighed against other factors. We know that we cannot eliminate poverty or improve health through income redistribution. We also know that treating episodic illnesses only makes a marginal contribution to health. Determinants of health researchers estimate the impact of quality health care on health at only 10 percent. Unfortunately, most low-SES individuals do not receive quality health care, defined by the Institute of Medicine as receiving all the care they need and needing all the care they receive. Doing nothing simply reinforces the cycle of poverty.