WHAT IF WE WERE EQUAL:

A MISSISSIPPI HEALTH ASSESSMENT

A PUBLICATION OF

THE MISSISSIPPI INSTITUTE FOR THE IMPROVEMENT OF GEOGRAPHIC MINORITY HEALTH at the University of Mississippi Medical Center

&

THE SOCIAL SCIENCE RESEARCH CENTER at Mississippi State University
Health venues in Mississippi, past and present
“What will it take to reduce disparities? What “systems change” could we undertake as a nation to assure that [disparities between black and white mortality rates] do not remain flat over the next four decades? Examples of systems change in health care would include universal health insurance coverage, a primary care medical home for each American, proportionate representation of African Americans in the health professions, and the elimination of bias in the delivery of diagnostic and therapeutic interventions. Systems change related to the health of communities would have to be much broader: from nonviolent and exercise-friendly neighborhoods to more nutritious food outlets, educational equality, career opportunities, parity in income and wealth, home ownership, and ultimately hope.”

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What if we were EQUAL?
INTRODUCTION

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INTRODUCTION

Mississippi has become a poster child for many of the societal problems affecting the disadvantaged of our nation. Of the challenges facing Mississippi, none are more important than the problems of health and health care pervading our population.

In 2005, in examining excess black mortality rates in America, former Surgeon General Dr. David Satcher asked America, “What if We Were Equal?” Inspired by Dr. Satcher’s work, our report What if We Were Equal: A Mississippi Health Assessment addresses health in Mississippi by asking some very straightforward questions.

- What if Mississippians had the same health and health outcomes as the rest of the nation?

- What if white Mississippians were equal to the nation’s whites? What if black Mississippians were equal to the nation’s whites?

- Essentially, what would it take for Mississippi to reach national norms?

What if we were EQUAL?
At its roots, this report is an investigation of health disparities. There are profound differences in health and health-related factors across our nation and among its peoples. These differences occur among groups at lower socioeconomic levels, among minority populations, and among rural communities. Identifying and investigating these differences is essential to improving our health. In fact, Healthy People 2010, which documents our nation’s vision and goals for improving health, names the elimination of health disparities as one of the two primary strategies for improving overall national health.

In Mississippi in particular, where health disparities are so severe and pervasive, the strategy of eliminating health disparities takes on particular import. Ultimately, the overall health of Mississippi cannot be improved without identifying and eliminating the complex and varied forms of health disparity existing in our state. This report aims to increase awareness and understanding of health disparities in Mississippi by addressing disparities in incidence, diagnosis, treatment, and prevention of select health issues.

The natures and forms of health disparities are varied and complex. Health disparities as gaps in quality of health, incidence of disease, or access to medical care can occur among specific populations as well as across demographic groups (e.g. according to race/ethnicity, gender, socioeconomic status, and residence) (Health Resources and Services Administration, 2010).

Moreover, disparities in health can occur not only as inequalities in quality of and access to medical care but also as inequalities related to behaviors, environmental conditions, and societal opportunities. For example, differences in individual behaviors that result in greater risk for disease or injury (such as tobacco use, diet, levels of physical activity, and alcohol consumption) can be viewed as important health disparities. Disparities in environmental factors such as water and air quality and the availability of safe and healthy foods also have significant impact, as do disparities in occupational environment and safety. As a result, health disparities can involve almost every aspect of society. These indicators are of utmost importance as they provide a more comprehensive picture of health and reveal important avenues for intervention.

Finally, many societal factors that contribute to health disparities intertwine with past and current politics and policy, minority discrimination, and cultural influences (National Institutes of Health, 2008). Hence, investigations into health disparity often move into realms not normally considered ‘health-related’ such as economics, sociology, and history.
CONCEPTS:

INEQUITIES VERSUS INEQUALITIES

When thinking about health disparities, one must understand the difference between inequality and inequity. While inequality is a measurable difference, inequity is a moral quality or judgement. “Health inequality is a descriptive term” which does not necessarily involve moral judgment, whereas recognition of a health inequity depends on an individual’s beliefs regarding justice, society, and the reasons underlying the existence of inequalities (Kawachi, Subramanian, & Almeida-Filho, 2002, p. 647). The term ‘health disparity’ typically refers to health inequities – health inequalities seen as preventable and/or caused by a situational or social injustice. Views on free will and personal responsibility for care often determine whether a health inequality is seen as a health disparity. However, the impact of prenatal and childhood influences on adult health and the dependence of “life chances ... upon contextual factors” significantly undermines the concept of an individual’s complete free will and total responsibility in regards to his or her health (Kawachi et al., 2002, p. 647). Moreover, an absolute concept of free will with regards to health fails to explain various phenomena, such as the persistent socioeconomic gradient in health (Kawachi et al., 2002). For some, this report will provide an objective and quantifiable analysis of the many health disparities that exist in our state. For others, it might also provide information about inequities that will challenge their sense of societal responsibility and moral obligation with regards to the health of our population.

MAJOR SOURCES OF HEALTH DISPARITIES

SOCIOECONOMIC STATUS

Persons “at a lower level of socioeconomic position – whether measured by income, occupational grade, or educational attainment” experience worse health (Kawachi et al., 2002, p. 649). For example,

“Americans with low [socioeconomic status] have levels of illness in their thirties and forties that are not seen in groups with higher [socioeconomic status] until three decades of age later” (Williams & Jackson, 2005, p. 327).

Moreover, experiences of worse health according to socioeconomic position hold true even for “those who are already in relatively high socioeconomic groups” (Kawachi et al., 2002).
INTRODUCTION

Health disparities due to socioeconomic status are attributed to differences in education, income, and health practices as well as psychosocial stressors associated with membership in lower socioeconomic classes (Williams & Jackson, 2005). Leading explanations for the socioeconomic gradient in health incorporate the concepts of relative income and relative poverty; that is, one’s good health depends not on obtaining some concrete amount of goods and services but instead depends on the level of goods and services obtained in comparison to the rest of society. One’s relative position in terms of society/income can affect health in multiple ways. First, relative income/societal position affects one’s access to goods (material commodities, social capital, etc.) necessary for ‘good’ health in a particular society. Second, being of lower income/societal position leads to psychosocial distress, which is associated with both direct and indirect effects on personal health (Kawachi et al., 2002).

“Chronic exposure to stress is associated with altered physiological functioning, which may increase risks for a broad range of health conditions. People of disadvantaged social status tend to report elevated levels of stress and may be more vulnerable to the negative effects of stressors” (Williams & Jackson, 2005, p. 328).

SOCIAL CAPITAL

The concept of social capital is an important tool in understanding the roots of these inequalities. Put simply, social capital is the benefit conferred on an individual because of their location in a structure of relationships (social network). This benefit, gained through particular connections to other people within a society, can often explain how some individuals attain greater success in particular settings (Pearce & Smith, 2003). Essentially, the “consequences of... macrolevel social and economic processes that influence health across the life course” create an individual’s social capital (Pearce & Smith, 2003, p. 122).

Differences in positions within social networks create differences in the social capital conferred on individuals or groups. These differences in the distribution of social capital engender the great divide between the haves and the have nots, the advantaged and the disadvantaged (Khmelkov & Hallinan, 2002). The unequal distribution of social capital informs the unequal distribution of wealth among different races and ethnicities, different places, etc. (LeClere & Soobader, 2000). Disparate distributions of social capital produce disparities in health, a cause and consequence of wealth.
The Mississippi Department of Health Central office (above) is located in downtown Jackson. The MSDH serves the health needs of Mississippi through a system of district and county offices. (Photo provided by MSDH, 2007.)

The Hinds County Health Department (below) is located in the Jackson Medical Mall, an ambulatory health care facility dedicated to serving the urban poor of Jackson, Mississippi. The Jackson Medical Mall is governed by the non-profit Jackson Medical Mall Foundation, which aims 1) to foster a holistic approach to health care for underserved populations and 2) to promote economic and community development in the surrounding district. The Mall houses commercial services and shops, restaurants, educational institutions, health care services, human service and nonprofit tenants, clinics, University of Mississippi Medical Center Ambulatory Clinics and Offices, City of Jackson Offices, and more. (Photo provided by MSDH, 2003.)

**RACE & ETHNICITY**

Most racial and ethnic minorities in the US suffer higher rates of morbidity and mortality in comparison to non-minorities. As of 2003, the greatest mortality rates in regards to cancer, cerebrovascular disease, heart disease, and HIV/AIDS belonged to African Americans. Though the health of Americans in general is improving, the disparity or gap between minority and non-minority health remains, and is actually increasing in many instances (Institute of Medicine (IOM), 2003).

A variety of theories surround racial (or ethnic) disparities in health. The oldest attribution is biology, or the belief that racial health disparities arise from genetically-inherited propensity towards certain health problems. However, several studies strongly dispute this conclusion. For example, when rates of hypertension and diabetes among West African and African-originating Caribbean populations are compared to rates among African American and Black British populations, widely differing health experiences are revealed. Only black populations in our western societies experience higher rates of hypertension and diabetes. If heritable factors had major importance, black populations should demonstrate similar health data no matter the location. Such studies imply that racial disparities are not simple matters of biology (Kawachi, Daniels, & Robinson, 2005).
The most popular explanation for racial disparities is socioeconomic status, i.e. race as simply a proxy for class (Kawachi et al., 2005). Race is an ascriptive characteristic, a feature, like gender, distinguishing an individual from birth. Ascriptive characteristics can deeply inform other characteristics, such as socioeconomic position, income, and place, which in turn influence an individual’s health (Kawachi et al., 2002). Thus, “race [can serve as a simple] marker for differential exposure to multiple disease-producing social factors” (Williams & Jackson, 2005, p. 325). The observation that minority groups are disproportionately found at lower socioeconomic levels with lower incomes supports the concept of race as a proxy for socioeconomic factors. Because these groups are disadvantaged in socioeconomics, they will see higher rates of socioeconomic-related health disparities (IOM, 2003; Kaiser Family Foundation (KFF), 2007).

However, the explanation of race disparities as class disparities is somewhat undermined by the finding that, within individual income groups, racial and ethnic disparities often persist, though at a reduced level (KFF, 2007). For example,

“For both males and females at every level of income, blacks have higher coronary heart disease death rates than whites” (Williams & Jackson, 2005, p. 325).

Minorities are also found to receive lower quality health care in comparison to non-minorities even when they possess equivalent insurance, ability to pay, etc., implying differential access to care based solely on race (IOM, 2003). Finally, it is incorrect and even disingenuous to dismiss racial differences as merely socioeconomic differences when race often informs an individual’s inclusion in a particular socioeconomic tier (Kawachi et al., 2005).

Other proposed contributions to racial and ethnic health disparities include cultural and environmental risk factors, the persistence of residential segregation leading to issues of neighborhood quality, income effects, increased violence, disease, lack of access to medical care, etc. (IOM, 2003; Williams & Jackson, 2005).
Sharp differences in health can be attributed to place. For example, before 1920, urban mortality far exceeded rural mortality, this phenomena attributed to more aggressive infection patterns in cities as a result of crowding, lack of sanitation, and “rapid turnover of both goods and people” (Hanes, 2001, p. 3). At the turn of the 20th century, white males in rural areas could anticipate living ten years longer than their urban counterparts. However, as science and medicine advanced, this penalty diminished, virtually disappearing by 1940 (Hanes, 2001). Recently, researchers have identified the emergence of a rural mortality penalty instead. Beginning in the mid-1980s, improvements in death rates began to slow for rural Americans, resulting in a significant and growing disparity in mortality and longevity between rural and urban populations (Cosby, Neaves, Cossman, R., Cossman, J., James, et al., 2008).

“The meaning of place is often shaped by factors such as race and ethnicity, religious and cultural beliefs, history, economics, and politics — conditions that often shape the context within which inequalities can arise” (Neaves, Feierabend, Butts, & Weiskopf, 2008; Tschirgi, 2001).

**GEOGRAPHY**

Understanding the connections between socioeconomic status, race and ethnicity, and place is key to understanding health disparities. It is exceedingly important for researchers to not only answer questions of who and where, but to also attempt to answer questions of why them and why there (Neaves et al., 2008; de Blij & Murphy, 2003; Campbell, 2001; Weeks, 2002).
While it is easy to see place as just geographical delineation, place is truly a proxy for a constellation of influences that include the consequences of history and the broad array of current circumstances that are brought together in a specific location. Place affects health both collectively and contextually. Collective effects are those effects experienced by an individual as a result of living among a large aggregation of individuals with certain common characteristics. Contextual effects result from political, cultural, institutional, ecological, and environmental factors inherent to a place (Kawachi et al., 2002). The notion of geography as a determinant of health is thus a complicated one, with varied and ambiguous causal factors.

For example, one major area of cross-over and confusion is at the intersection of race and place. Health care utilization and outcomes vary overall according to place; levels of race-disparity also vary according to place. Minority groups “tend to seek care from different hospitals and from different physicians compared to non-Hispanic Whites” (Chandra & Skinner, 2003, p. 2). Also, the size and presence of racial and ethnic populations vary across place, with, for example, higher minority populations in the West and South (KFF, 2007). Determining whether variation in health outcomes is race- or place-specific thus becomes a challenge:

“One may falsely diagnose geographical variation as racial disparities, and conversely” (Chandra & Skinner, 2003, p. 3).

Mississippi, ensnared as it is in problems of economy, history, and race, is a perfect example of the quagmire race and place causation can become.
Health disparities in Mississippi reach back to the roots of her history. From the early days of plantations and slavery, through segregation, to the corridors of the modern hospital, unequal access has been a constant struggle. While many of the causes of disparities of the past have been answered with new policies and regulations, the effects of centuries of discrimination continue in disparate health outcomes for blacks and whites. A history of segregation, experimentation, and discrimination in health care continues to cause disproportionate suffering amongst African Americans in Mississippi.

During the era of slavery in Mississippi, one Mississippi physician called for his peers to seek to understand the “peculiarities” of black medicine, due to the significant role blacks played in the development of the South (Rice & Jones, 1994). Perceived differences in the reactions of blacks and whites to medical treatments and perceptions of differences in susceptibility to certain diseases and resistance to others led to the development of literature that touted distinctions between the black and white patient. For example, blacks were believed to be less susceptible to diseases of the field because of their ability to fight malaria, today known to result from higher prevalence of the recessive sickle cell gene. Meanwhile, common medical practices of the day such as leeching were pursued much more aggressively with black patients, further weakening sickened slaves and leading to claims that they were more susceptible to other diseases. These same differences were often used as political fodder, to support the concept of slaves as inferior and to defend their use as field hands, with the argument that they were better suited than whites to work in the fields because of their ‘immunity’.

**GREENWOOD LEFLORE HOSPITAL**

Greenwood, named for Choctow chief Greenwood Leflore, is found on the eastern edge of the Mississippi Delta. In the past, Greenwood enjoyed a thriving cotton economy, which faltered after the Civil War but resurfaced with the arrival of railroads that made the city a major shipping point for cotton once more. With the decline of the cotton economy, Greenwood saw an end to its boom.

Greenwood Leflore Hospital was initially established in a converted house in 1906 (above) by the King’s Daughters’ Society with the help of the City of Greenwood and Leflore County. A new hospital building was built in 1918, again with the help of the city and county, and in 1931, the Society gifted the hospital to the city and county, at which point the hospital’s name changed from King’s Daughters’ to the current Greenwood Leflore Hospital. In 1936, a 30-bed annex was added, but by 1952, GLH moved to a new
In addition to receiving differential care, slaves were often used as subjects for medical experimentation without their consent. Some physicians even purchased slaves for this purpose. The types of experiments conducted on slaves ranged from experiments in heat exhaustion and new medicines to excruciatingly painful surgical techniques. It is reported that one female slave, Anarcha, who was owned by the much lauded “father of American gynecology” Dr. James Marion Sims, underwent more than thirty operations without anesthesia before Sims succeeding in finding a technique that would heal her vesicovaginal fistula. He also experimented on ten other female slaves in the pursuit of this cure. The ethical standards of the day made it unheard of to utilize these techniques on whites, but the status of slaves permitted the use of blacks throughout the South in medical experiments, leading to pervasive mistrust of American doctors within the black community (Washington, 2006).

During this era, a slave's health care was entirely dependent upon the slave owner’s pursuit of that health care. While slaves did not necessarily receive quality medical care, the economic interests of the slave owner made slave illness a hindrance to his livelihood. As a result, slaves were often seen by the same doctors that saw and treated slave owners and their families, at the expense of the slave owner. By some accounts, slaves actually received better medical care than their free counterparts because of this economic interest (Rice...
The legacies of the plantation economy, the Civil War, and economic hardship do not just affect black Mississippians. The century following the Civil War saw an unequal distribution of wealth that created a small wealthy elite and left the majority of the state in poverty.

& Jones, 1994). However, the need for labor often pushed slaves back into the field before they could heal and the filth and malnourishment that accompanied their living conditions made them more susceptible to disease than their white counterparts. Additionally, due to mistrust of white doctors and an effort to retain some autonomy over their own bodies, blacks often turned to home remedies and herbal medicine to avoid the white doctors. Due to slave owners’ objections to herbal remedies, slaves often hid illnesses from their owners, seeking white medical attention only when they were completely overcome by illness.

The end of slavery quickly produced the need for a source of medical care for freed slaves. While the care of blacks had once been the responsibility of slave owners, this care became the responsibility of the state. In 1865, The Freedmen’s Bureau was established with a provision for the establishment of a Medical Division. This division operated hospitals and pharmacies and visited ill freedmen. In Mississippi, the Bureau’s network of physicians and attendants served more than 25,000. However, unsanitary conditions in some of these hospitals led to sickness and death for a number of the freedmen they served. With the end of the Freedmen’s Bureau in December of 1868, differential access became the norm in Southern health care (Rice & Jones, 1994). Meanwhile, Radical Reconstruction only furthered existing Southern disdain and uneasiness about Northern ideas, and many Southerners believed only physicians trained in the South were capable of dealing with their “peculiar” medical problems. As a result, medical practices for the entire Southern population suffered.

Where blacks were not denied access to care, they were segregated into separate wards. Public hospitals rarely accepted blacks, and some cities even paid private hospitals to do so. Such separation of public facilities was declared constitutional by the famous Plessy v. Ferguson Supreme Court case which approved “separate but equal” facilities. Supposedly
‘separate but equal’ practices led to the development of disparate numbers of white and black hospitals, medical schools, and beds for white and black patients. Mississippi communities often created separate hospitals to serve the black community. In 1946, the Hill-Burton Act was passed, providing funding for the expansion of medical services across the country. This act contained a separate but equal clause that would further develop the divide between black and white hospitals. However, in 1962 a challenge of this clause made its way to the Supreme Court where it was found to be unconstitutional. The regulations were revised to state that all portions of a facility funded through the Hill-Burton Act would be available to all persons “without discrimination on account of race, creed, or color” (Rice & Jones, 1994). Despite these significant legal changes, African Americans have continued to experience differential access to health care and often suffer more severely from poor health outcomes as advancements in the medical system filter to their communities last.

Moreover, the legacies of slavery and the plantation system led to problems outside of the health care system that also create and/or affect health disparities. The 20th century saw rampant disenfranchisement and racial oppression of blacks in Mississippi. As a result, the black population of Mississippi has seen severely limited accumulation of capital. In “the early 1990s, nearly two-thirds (64%) of African Americans in Mississippi reported family incomes of less than $20,000 a year before taxes, compared to less than one-third (31%) of whites,” while whites were “more than twice as likely as blacks to report making over $40,000 per year, and nearly twice as likely to be college graduates” (Shaffer & Neaves, 2008, p. 168). Such disparities in economic resources and education can have massive impacts on health.

It is important to recognize that the legacies of the plantation economy, the Civil War, and economic hardship do not just affect black Mississippians. “The slave holding plantation economy that drove the state’s antebellum economy was shattered by the Civil War. In the ensuing years, the state never fashioned an adequate industrial base, continuing to rely overwhelmingly on agriculture. This left vast numbers of people in poverty or near poverty” (Waltman, 2001, p. 24). The century following the Civil War saw a greatly unequal distribution of wealth, with the majority of the state “mired in relatively primitive economic conditions” with the exception of a small wealthy elite. Though today’s Mississippi no longer depends on the flawed agricultural system of old, our history still haunts us and no significant economic innovations have developed to ameliorate the ill effects of our past. Our problems of poverty persist, with no facile solutions in sight (Waltman, 2001).
MISSISSIPPI TODAY

In 2008, an average of 13.2% of Americans lived below the poverty line. In contrast, **21% of Mississippians lived in poverty in 2008**, giving Mississippians the largest population (by percentage) living below the poverty line in the entire nation (U.S. Census Bureau, 2006-2008).

Socioeconomic disparities in Mississippi are visible across several other measures, such as those for income and educational attainment. **Mississippians were last in the nation in median income.** While Americans attained a median income of $52,175 in 2008, Mississippians only achieved a median income of $37,404.

**In 2008, 1 in 5 Mississippians lived in poverty.**

**Median income in Mississippi was $14,771 below the national average.**
Additionally, Mississippi also placed last across the nation in attainment of a high school education and 48th in achievement of college education. Only 78.8% of adult Mississippians held a high school diploma or higher and only 19% held a bachelor’s degree or higher in 2008, compared to 84.5% and 27.4% of adult Americans, respectively (U.S. Census Bureau, 2006-2008).

Mississippi’s poor status in socioeconomic measures leaves us ripe for the emergence of health disparities, and in fact, Mississippi leads the nation with regards to overall mortality and trails the nation in life expectancy.

In 2008, 5.7% fewer adult Mississippians held a high school diploma compared to the nation.

Roughly 2 out of every 3 adult Mississippians without a Bachelor’s degree would have received a college education if we had performed like the nation.
In 2006, the nation saw a rate of 777 deaths per 100,000. Mississippi, with the worst rate in the nation, saw 966.8 deaths per 100,000 (CDC, n.d.). On average, those born in the United States in 2000 have a life expectancy of 76.9 years; Mississippians born in 2000 are projected to live to an average of 73.7 years, placing our state last in the nation in life expectancy. Statistically speaking, by virtue of being born in Mississippi, a child can anticipate 3.2 fewer years of life compared to children across the nation (U.S. Census Bureau, 2008; U.S. Census Bureau, n.d.).

Mississippi was the worst state in the nation for both mortality rates and life expectancy, exceeding the national mortality average by 189.8 deaths per 100,000 and trailing the average American life span by 3.2 years.
Mississippi is particularly sensitive to the occurrence of health disparities along racial or ethnic divisions. As discussed above, Mississippi has a complex history with regards to race and place. Moreover, strictly from a statistical perspective, issues of racial health disparity hold greater impact for our state because of our demographics. In 2008, 37.1% of the Mississippi population self-identified as black, conferring on Mississippi the largest population (by percentage) of black Americans in the nation. In comparison, black Americans make up only 12.3% of the nation as a whole (U.S. Census Bureau, 2006-2008).

Finally, Mississippi is vulnerable to occurrence of health disparities due to geography. Compared to an 8% rise in the US population from 2000 to 2008, population growth was very low in Mississippi, rising by only 3.3% (U.S. Census Bureau, 2008). These low rates of population growth in Mississippi reflect heavy out-migration, low immigration, and, arguably, shorter life expectancy compared to the rest of the country (Waltman, 2001). In 2008, Mississippi’s 46,907 square miles were home to only 2.9 million people in 2008, translating to a ratio of 61.82 persons per square mile (U.S. Census Bureau, 2008). As health care improves, access to good medical care has increasing impact on a population’s health. As discussed above, health penalties are growing for persons living in rural versus urban settings. In 2000, 51.2 % of the Mississippi population was rural, compared to 21% of the US population as a whole (U.S. Census Bureau, n.d.).
THE CANARY IN THE COAL MINE

The canary in the coal mine is a harbinger of danger. Before the advent of technology capable of detecting lethal gases, canaries, which die from exposure to very small amounts of toxic gas, were kept in cages inside of coal mines. So long as the canary chirped and sang, miners knew the air was safe to breathe. When the canary exhibited signs of distress, the miners knew they were at risk. The canary in the coal mine as a metaphor warns that what the canary suffers, soon so will the rest of us. Ignoring the canary’s fate imperils oneself.

Mississippi, delicately balanced over a legacy of racial tensions and poverty and stressed by contemporary problems of socioeconomics and infrastructure, often serves as a canary in the coal mine for the United States.

For example, in 1991, for the first time, certain states saw their population’s rate of obesity rise above 15%. Mississippi (along with Louisiana) led this group of 4 states with an obesity rate of 15.7% (Mokdad, 1999). Today, obesity is an epidemic plaguing the entire nation.

Mississippi’s racial demographics alone often make our state the stage on which national problems of racial disparity are first noted. Similarly, disparities affecting lower socioeconomic tiers and rural populations are more rapidly visible in our state.

CONCEPTS:
The Canary in the Coal Mine

NATIONAL EFFORTS INFORMING OUR REPORT

During the 1980s, awareness and concern about health disparities, especially among minority groups, began to rise. It was clear that the continued improvement of the health of the nation would require a new agenda that included the improvement and elimination of health disparities. In 1985, the Secretary of the Department of Health and Human Services (DHHS) issued a landmark document entitled, “Perspectives in Disease Prevention and Health Promotion Report of the Secretary’s Task Force on Black and Minority Health,” bringing to light the problems of racial and ethnic health disparities in the United States. The Office of Minority Health (OMH) at the Department of Health and Human Services was established in response to this report, as was an Office at the CDC, which eventually became the Office of Minority Health and Health Disparities (OMHD).
The OHMHD has become a national force, providing leadership and coordination of efforts to eliminate disparities in our nation’s health. The scope of the Office has expanded over time and now includes “health disparities experienced by populations defined by race/ethnicity” as well as “[by] socioeconomic status, geography, gender, age, disability status, and risk status related to sex and gender” (OMHD, 2009, History of the Office, para. 4).

Currently, the OMHD outlines six priority areas “in which racial and ethnic minorities experience serious disparities in health access and outcomes” as well as four additional areas of disproportionate impact on racial/ethnic minorities (OMHD, 2009b, Eliminating racial & ethnic health disparities, para. 5). These ten areas of disparity are:

- Infant Mortality (1 of 6 priority areas)
- Cancer Screening and Management (priority area)
- Cardiovascular Disease (priority area)
- Diabetes (priority area)
- HIV Infection/AIDS (priority area)
- Immunizations (priority area)
- Mental Health (1 of 4 areas of disproportionate impact)
- Hepatitis (disproportionate impact)
- Syphilis (disproportionate impact)
- Tuberculosis (disproportionate impact)

In developing the organization and content of What If We Were Equal? A Mississippi Health Assessment, we have relied heavily on the priorities identified by OMHD for the structure of our chapters and the selection of data sources.

The second guiding force for our report is Healthy People 2010. Healthy People 2010 comprises our national health objectives from which federal, state, and community health policies and focuses may be derived. The 2010 report expands on the goals and successes of two previous reports – Healthy People 2000: National Health Promotion and Disease Prevention Objectives, and its predecessor, the 1979 Surgeon General’s Report titled Healthy People (DHHS, n.d.a).

The various components of Healthy People 2010 inform two overarching goals: 1) to increase the quality and years of healthy life of the population as a whole and 2) to eliminate health disparities that occur between different groups within the population. In pursuit of these goals, Healthy People 2010 identifies 28 Focus Areas for “disease prevention and health promotion” (DHHS, n.d.b).
WHO WE ARE

In September 2006, the Mississippi Institute for the Improvement of Geographic Minority Health (MIIGMH) was established through a competitive grant awarded by the Health and Human Services’ Office of Minority Health Research. The goals of the organization include improving awareness of health care issues among minorities and disadvantaged people dwelling in rural areas as well as increasing access to health care for these populations. MIIGMH also focuses on increasing the number of health care providers who attend to minority populations, improving health outcomes for these groups, and developing a model for health disparities elimination that is effective and replicable across the nation.

The Institute has a core strategy of developing partnerships with a broad array of organizations in Mississippi that are involved with health and health-related aspects of the state. One of these organizations is the Social Science Research Center (SSRC) at Mississippi State University. The partnership between the SSRC and MIIGMH resulted in a goal to jointly produce reports and other resources that would provide an information infrastructure that assists the Institute’s goal of improving geographic minority health. This report was developed as part of this joint venture.

It is our ambition that the information provided in What If We Were Equal? A Mississippi Health Assessment will be utilized by the various partners of the Institute to help establish Institute priorities, develop specific programs, and encourage the explicit inclusion of a geographic and minority perspective in state and local health planning and policy. In addition it may inform decisions about health care delivery by public and private health providers.
STUDY FOCUS

This report examines the major areas of health disparity experienced by racial/ethnic minorities, as identified by the Office of Minority Health and Health Disparity, comparing the status of Mississippians in these areas to the status of Americans in general. Typically, we have measured these areas of disparity using Healthy People 2010 indicators.

To cultivate a slightly more coherent narrative within this report, as well as to broaden its scope somewhat, we have reordered the ten OMHD priority areas into five categories, which are as follows:

**Child Health**
This section investigates **Infant Mortality**, one of the six OMHD focus areas, along with **Low Birth Weight** and **Preterm Births**. We also look at **Childhood Immunizations** (part of the OMHD focus area of Immunizations) and **Disease Incidence**. Finally, we look at the growing epidemic of **Childhood Obesity**, as well as rates of **Physical Activity** amongst adolescents.

**Obesity, Cardiovascular Disease, and Diabetes**
This section investigates **Obesity** and two of the six OMHD focus areas, **Heart Disease and Stroke** (representing the OMHD focus area of Cardiovascular Disease) and **Diabetes**. In addition, we look at several **Risk Factors**.

**Cancer**
This section encompasses the OMHD focus area of Cancer Screening and Management. Specifically, the section will investigate **General Cancer Rates**, **Lung Cancer**, **Oropharyngeal Cancer**, **Breast and Cervical Cancer Screening**, **Prostate Cancer**, and **Colorectal Cancer**.

**Additional Areas of Disparity**
This section investigates **Suicide** (as part of the OMHD priority area of Mental Health), the OMHD priority areas of **HIV Infection/AIDS**, **Syphilis**, **Hepatitis**, and **Tuberculosis**. In addition, we will examine **Unintentional Injury Mortality** and **Homicide**.

**Access to Care**
This chapter will discuss factors that influence the ability to obtain medical care and health services. Areas examined will include **Adult Immunization** (an OMHD focus area), **Pneumonia Mortality**, **Insurance**, **Usual Primary Care Providers**, and other factors surrounding **Access to Care**.
METRIC FOR MEASURING DISPARITY

The study of inequalities in health outcomes and access to quality health care has been approached from a wide variety of perspectives. **This report seeks to identify and understand inequalities in Mississippi, using two specific areas of disparity – geographic and racial.** (Note that these two areas do not encompass the full scope of inequality in Mississippi. For example, analysis by socioeconomic status is one major concept left out of this report, due to space constraints. Differences in socioeconomic status tend to exacerbate racial and geographic inequalities.)

In examining geographic disparities, this study compares overall rates of mortality, screening, and behavior incidence in Mississippi to those for the nation and then examines the progress of both groups toward the Healthy People 2010 goal.

In looking at racial-geographic disparities, this study only examines black and white populations due to the low numbers of other groups in Mississippi. While Hispanic populations are growing in Mississippi, and across the nation, in most instances the available data for Hispanic and other populations in Mississippi is still unreliably small, especially for survey-based indicators (such as the Behavioral Risk Factor Surveillance System (BRFSS), the Mississippi Healthy Survey (MHS), and the Youth Risk Behavior Surveillance System (YRBSS)).

To understand the racial disparities between achievement in Mississippi and achievement at the national level we compare white and black Mississippians to whites across the United States. While not the highest achievers in every single instance, white national averages indicate the rates achieved by the majority of Americans and therefore what should be possible for all. Hence, to answer our driving question, “What if we were equal?”, we detail how Mississippians, both black and white, would perform if they were equal to whites in (or the majority of) the US. Using a national average would not be as effective a measure of what the majority achieves, because racial and ethnic disparities exist across the country and would be reflected in national averages. Setting the national average as the goal would thus underestimate what our population is truly capable of attaining. Because we use this method of comparison, it is important to keep in mind, however, that racial differences displayed at the state level also often exist across the country. For example, in the case of infant mortality, our report will show the reader how far black Mississippi infants fall behind white infants across the nation. What you will not see, however, is how blacks all across the United States experience infant mortality at higher rates than whites. While such information is important, it does not speak to our central question, and is thus not addressed herein.
DATA

In order to comprehensively assess the state of health in Mississippi, a broad set of data were utilized. These data fall into a few distinct categories: mortality data, incidence data, and survey-based data. Mortality data and incidence data are the most straightforward forms of data utilized in this report.

The Centers for Disease Control and Prevention (CDC) maintain national mortality records with detailed information on primary and secondary causes of death, providing a comprehensive set of mortality data for both the national and local level (Compressed Mortality File (CMF), CDC Wonder). Mortality rates for disease are calculated per 100,000 deaths and are age-adjusted to the 2000 US standard population. It is important to note, that so called ‘total’ US and MS mortality data in our report actually only include black and white data. (The exception to this rule is CMF map data, where totals include all races.) CDC Wonder also provides extensive data on infant birth and death. Infant birth and mortality records are calculated using CDC Wonder and rates are stated per 1,000 live births.

Incidence reports, like mortality data are very straightforward. The CDC tracks incidence of reportable diseases, as it is reported by individual states. Many states vary in the diseases that are reported. However, this data is taken from the National Notifiable Diseases Surveillance System, and is reported in accordance with national standards for disease reporting. Natality and immunization data also originate from the CDC.

While mortality and incidence data allow an understanding of the diseases affecting a population, survey-based data allows researchers to capture lifestyle differences and more subtle indicators of health inequalities. This study relies heavily on the national Behavioral Risk Factor Surveillance System (BRFSS), which measures a wide variety of indicators from physical activity to health care access and screening frequencies. This data is collected at the state level and aggregate information is available for the nation as well. We have weighted this survey data to ensure proper representation of the population.

In addition to BRFSS, this study uses survey data from the Mississippi Health Survey, conducted by the Social Science Research Center at Mississippi State University. While this data only addresses Mississippian, it provides a unique glimpse of health access not captured in many national level surveys. The data from the Mississippi Health Survey were weighted to be representative of the state population using US census population estimates.

Finally, this study utilizes the Youth Risk Behavior Surveillance System (YRBSS) to assess difference in adolescent behavior and health. YRBSS data is collected at the state level and aggregated for the national
level through a process similar to BRFSS data. This data is more limited due to the limitations of surveying children, but provides a glimpse into the health of the children of Mississippi and the US and what the country can expect in the coming years.

In addition to the collection of data from a wide variety of sources, extensive review of relevant literature was conducted, providing additional insight into the health of Mississippians. A wealth of information was collected from sources such as the Mississippi Department of Health, KIDS COUNT, the National Cancer Institute, and the National Institutes of Health (NIH), and these sources were vital in providing information required to create context for the vast amount of statistical data addressed in this manuscript.

REFERENCES


CHILD HEALTH

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Robert Greenberg, M.D.

Impact of the larger world
In this chapter, we will provide you with some basic statistics on child health in Mississippi as she compares to the nation. While these measures reflect major problems of child health and sources of disparity therein, they are only a partial skeleton of a much more complicated story. In this preface, we endeavor to introduce some of the larger concepts and contexts that color current studies of child health and health disparities. These concepts will hopefully provide you with a richer context in which to assess the statistics presented in our chapter.

Major issues in child health over the years
Children, living in both developed and developing nations, are experiencing, on average, better health and developmental status as the years go by. Infant mortality rates, specific disease rates, control of infectious disease, and school readiness have all improved among today’s children compared to those of the past (Palfrey & Richmond, 2005). However, this rosy assessment represents the average for the
population of children as a whole. Over recent years, a very different picture has been found beyond the statistics of the whole. Hidden behind the averages are sharp differences between groups of children - these differences occurring according to socioeconomic status, geography, race, culture, ethnicity, and gender (Graham, 2009; House & Williams, 2003; Wilkinson, 1999).

Immense differences in health outcomes are seen between specific groups. For example, the rate of children born prematurely is almost double in the black population compared to the white. Similar differences also exist in terms of the number of children and youth who are obese. In some situations, effects of race and racism appear to correlate most closely with health data, whereas in others, socioeconomic factors present as more proximal factors. Place also plays a significant role. If only total population data are examined, these striking disparities between different groups of children are hidden. As more and more findings of discrepancies between different groups of children emerge, there is urgent need for public approaches to remediate these disparities.

**Distinguishing between health inequality/disparity and health inequity**

When attempting to understand and respond to health differences between groups, it is necessary to be clear about the implied meaning of descriptive terms. Health equality or disparity is usually viewed as the result of a chain of events and involves differences in a) environment, b) access to, utilization of, and quality of care, c) health status, or d) a particular health outcome that requires examination.

Health inequity refers to unfair or unjust differences in health determinants or outcomes, within or between defined populations. Health inequity usually references differences in health status of specific populations and mortality rates that are systematic, patterned, unfair, unjust, and actionable, as opposed to random or being caused by those who become ill. The use of the descriptors “unfair” or “unjust” also assumes that eliminating the inequity requires changing the systems of privilege/conditions producing inequity rather than just treating their consequences through programs or social services. The term “health inequity” carries with it a social responsibility to do one’s best in order to correct the factor(s) that have led to the variance. It logically brings the citizenry, health professionals, and other helping groups into the fray as participants in the process of correcting social errors.

**The critical importance of social determinants of health**

Social determinants of health refer to the social and economic conditions that influence or determine the health of individuals, communities, and nations. Social determinants reflect measures which designate socioeconomic position, including both material and social resources as well as rank or status in a social hierarchy (Krieger, 2001).

The assumption is often made that improvements in health status primarily reflect better access to effective health care, to the application of technology to the service of patient care, to the improvement
in preventive care via immunizations, as an example. Indeed, the above are requisite components of effective health care and prevention. During the past several decades, however, a powerful understanding of the importance of social determinants of health has emerged. The many observations that have been reported, primarily in the British and Scandinavian literature, can, collectively, claim a legitimate role as one of the truly great scientific breakthroughs of our times. While the overarching importance of poverty in determining health status of both children and adults has long been recognized, several critical components of this interlinkage have now emerged.

The lower one is in terms of socioeconomic position, the higher the infant mortality rate, the lower the length of survival, and the higher the mortality rates of adults as well as children. This relationship persists over time and cause of death or disease. However, it is not poverty alone that is the primary determining factor. In many studies, it has been demonstrated that countries (and states in the U.S.) exhibit health data that reflect not absolute income but income inequality instead. Investigations of standard measures of population health, such as life expectancy or infant mortality rates, have revealed the surprising finding that, among developed nations, the standard measures of health correlate best with income inequality (Kawachi, Kennedy, & Wilkinson, 1999). The United States, while having one of the highest average standards of living, has comparatively greater differences between the wealthiest and poorest segments of the population and thus ranks low among developed nations in terms of life expectancy, outcome of pregnancy, and infant mortality. The mechanism(s) by which income inequality exerts deleterious effects on health status remain obscured, although numerous theories abound. In general, theories cluster around three factors: 1] Access to life opportunities, such as education; 2] relationship between income inequality and social cohesion; and 3] psychosocial explanations. The question “What is the significance of greater equality of income?” emerges as a result of these findings. Accumulating evidence supports the contention that income inequality is associated with a range of health effects including lower life expectancy, higher rates of infant and child mortality, shorter height, poor self reported health, low birth weight, depression, mental illness, and obesity (Pickett & Wilkinson, 2009). Health becomes a sensitive and powerful marker for the consequences of societal organization. Direct action to create a more equitable society may continue to be difficult; however, the evidence to support the importance of income distribution across society appears to be overwhelming.

The importance of poverty in the lives of children is highly visible when looking at poverty statistics in our country. The prevalence of poverty is shocking; approximately 40% of children (ages 0-18) live in low-income families. Approximately 60% of American Indian, Hispanic, and African-American children live in poverty, whereas 25% of white children and 30% of Asian children are similarly compromised. A higher percentage of children in the South live in low-income families than any other part of the nation. The Federal Poverty Line (FPL) is still considered to be $21,200 for a family of four (2008); most research indicates that approximately twice that amount is needed to support a family (Douglas-Hall & Chau, 2008). While education is one marker of socioeconomic status, it is important to note that
49% of children in low income families live with parents who have some college experience. Poverty in and of itself imposes barriers of multiple forms. The constellation of socioeconomic ills accompanying poverty, and the discrepancy between those in poverty and the wealthiest members of society (income inequality) create even more obstacles.

**Lasting effects of early experiences on children**

The impact of early factors on the later lives of children and the adults they become is increasingly apparent. Attention on the long-lived consequences of early events gained prominence through the studies of D. J. P. Barker who began to demonstrate that intrauterine growth retardation was associated with increased rates of cardiovascular disease in adulthood (2007). Similar observations correlate cardiovascular disease in adults to exposure to poverty or environmental stress (defined in a number of ways) during gestation. Findings on the impact of early events on later life have expanded markedly, providing increasing evidence for the impact of social determinants on developmental trajectories.

Similar understandings have emerged regarding the primary tasks of childhood: social development, ability to be an effective member of groups, and school readiness. In each of these areas, social determinants are demonstrated, along with genetic mechanisms, to exert direct effects (Duncan & Brooks-Gunn, 1997). Countless studies address the importance of environment in modulating early childhood development. For example, breadth of exposure to abuse or household dysfunction during childhood strongly correlate to multiple risk factors for several of the leading causes of death in adults (Felitti et al., 1998). When environment is dissected, home and community factors combine with socioeconomic, geographic, and cultural factors as driving forces that indelibly shape children during early life.

The long-term consequences of events occurring at early periods of life, including the prenatal period is an area of growing inquiry. The overall significance of this relationship remains to be clarified; however, enough is currently known to validate assumptions that interactions between the developing child and biological, environmental, and psychological factors can play a significant role in the health and well-being of a child from early years through adulthood.

**The role of technology in determining health status**

The advent of new technology is presented as a striking and positive characteristic of health care in our country. Indeed, during the last thirty years, amazing technological advances have been made in the service of patient care. Such advances have often simplified diagnostic approaches, energized treatment, created new ways of thinking about the delivery of pharmaceuticals to patients, and made surgical approaches less invasive and safer. Yet, the question of whether or not technologic advances have a solely positive effect on the health status of our people remains only intermittently studied.

Paul Wise has asked intriguing questions about whether new technologies reduce or actually increase
inequities between different groups of people (2005). The discrepancy in neonatal mortality rates experienced by black as compared to white newborns is significantly reduced if all sick newborns have access to high technology care. If such access is not available, along socioeconomic lines, the inequities experienced by black newborns are actually accentuated.

Meanwhile, congenital malformations occur at increased rates in babies from lower socioeconomic groups as well as in babies who are the products of reproductive technology. The discrepancy between black and white babies in terms of congenital anomalies has actually been reduced by the advent of reproductive technology, because such advances are much less available to black women. Thus, disparity is decreased in an undesirable way, as the rates of anomalies for women linked with usage of reproductive technologies increase, bringing that group closer to the higher rates experienced by black women.

It is important to consider the role of technology when thinking about child health and health disparities. Utilization of various technologies differs according to social factors and constitutes an important component in the social determinants of health.

**The significance of health problems affecting Mississippi children**

Two primary child health problems, low birth weight and obesity, are focuses in the subsequent chapter. These problems 1] have great impact on the health in childhood; 2] exist amidst a plethora of ideas regarding their causation, with evidence for social as well as biological mechanisms at play in their genesis; 3] have significant impact on the health of the adults the affected children become; and 4] exist among black children to a much greater extent than among white children.

The impact of premature birth and/or intrauterine growth retardation cannot be overstated. Approximately 40 percent of all childhood deaths occur in the first month of life, and 68 percent of all neonatal deaths occur in infants born weighing less than 1,500 grams (very low birth weight) (Wise, 2004). Neonatal mortality differs markedly between black and white newborns. The survival of low and very-low birth weight infants is similar between black and white babies. The huge difference in neonatal mortality is thus explained by the increased prevalence of low birth weight babies in black women. Although multiple mechanisms have been proposed, the reasons for such discrepant rates remain obscure. Clearly, poverty, while playing some role, is not the primary cause, since Hispanic and Native American women from equal or more severe socioeconomic conditions do not produce low birth weight infants at rates greater than whites. Much attention is accredited to the effects of racism, although the pathophysiologic mechanisms whereby such societal events affect gestation are unknown. Increasing knowledge is accruing regarding the regulation of placental blood flow and its role in regulating placental function and fetal growth. Further studies on properties of placental structure and function may lead to greater understanding of variations in fetal growth. Factors that regulate the length of gestation also require further study.
The explosion of obesity in children and youth in recent years and recognition of the long-term consequences of obesity in both youth and adults also represent a health problem of immense magnitude. Obesity is associated with serious complications over time, including hypertension, heart disease, and kidney failure. As with low birth weight, the African-American population exhibits a greater prevalence of obesity in children, youth and adults. Obesity appears to occur more frequently in children and youth from low socioeconomic families without a clear racial bias beyond the disproportionate representation of black populations in lower socioeconomic positions. Since obesity occurs from an imbalance in the energy intake vs. energy expenditure ratio, it might be surmised that elucidating underlying mechanisms producing obesity should be straightforward. Factors such as reduced availability of low fat, low caloric foods in communities where people in poverty live, reduced expenditure of calories via exercise related to inadequate park or playground resources or concern about community violence, increased time spent watching television, poorly designed school lunch programs, and excessive intake of soft drinks represent some prevailing concepts. To date, it has been extremely difficult translating any putative causative factor into effective programs of either prevention or treatment. Principles and practices of public health, linked with public policy, will be required to modify prevailing trends.

These two immense health problems obviously require further understanding in terms of the pathophysiologic processes that underlie their occurrence. It is, however, equally apparent that such mechanisms must occur in the context of socioeconomic, psychological and/or environmental factors of equivalent importance.

The importance of other markers of health status of children that are often inadequately emphasized

Robert Haggerty, over 20 years ago, led child health professionals to understand the importance of what were termed “new morbidities,” emphasizing emotional and cognitive development, school readiness, and performance (2006). The impact of his teaching has focused on several arenas: a) the importance of looking at developmental events as interactions between a child and his/her environment, and not just expressions of an individual child’s intrinsic biologic/genetic signals, and b) a beginning search for the broader community-based factors that comprise social determinants of health. During the past several decades, the search has intensified for an understanding of just how environmental, socioeconomic, and psychological factors can exert adverse effects on the health of children and youth.

In that context, it is important to try to put into focus those factors that represent the main obstacles to normal growth and development. Death and disease-related morbidity remain a primary subject of attention by child health professionals. In addition, the manner by which children acquire the skills necessary to learn, the specific capabilities required for interacting successfully and meaningfully with others, the requirements for recognizing one’s interdependence with others, and the opportunities to develop a calm as well as optimistic sense of self all pose as necessary steps in successful development. They too are a reflection of both biologic and social determinants. Recognizing the duality of biological and social determinants to health emphasizes the potential impacts of inequality.


**About the Contributing Editor**

Robert Greenberg received his pre-medical education at Stanford University, and his medical education at the University of California, San Francisco. After receiving clinical training in Detroit at the Children’s Hospital of Michigan, he became a post-doctoral fellow in pediatric endocrinology at the Upstate Medical Center, Syracuse, New York. He then completed a year-long fellowship at the Fysiologiska Institute, Karolinska Institute, Stockholm, under the tutelage of Nobel Laureate Ulf von Euler, M.D.

Dr. Greenberg joined the faculty of the Department of Pediatrics at Stanford University in 1960. Ten years later, he was appointed Professor and Chairman, Department of Pediatrics, Charles R. Drew Postgraduate Medical School and Martin Luther King, Jr. General Hospital, in the Watts district of Los Angeles. In 1977, he moved with his wife and children to New Mexico, as Professor and Chairman, Department of Pediatrics, University of New Mexico School of Medicine. After resigning his position as Chair in 1987, Dr. Greenberg has remained on the New Mexico faculty.

Dr. Greenberg served as Chair of the Board of Directors, Center for Research in Child Health, American Academy of Pediatrics. It was in this position that he established a relationship with the Social Science Research Center (SSRC) at Mississippi State University. He has collaborated with the SSRC on a number of projects. During his academic career, he has been an active biological researcher, and he served as a member of NIH Study Sections for twelve years. Dr. Greenberg has visited over 38 countries, giving talks in many of them. For the past five years, he and his wife, Dr. Maggie Greenberg, spend two months each year volunteering at various international sites. Bob is very active in the Society for Equity in Child Health and is involved in several writing projects related to the linkage between child rights and child health.
Healthy People 2010 examines several different factors when considering child health. These factors include infant mortality rates, premature and low birth weight rates, immunization rates, obesity, and physical activity. While many other dynamics play a role in the health and lifestyles of children, these data present a snapshot of child health, particularly in areas with high potential for disparity.
The health of children today will determine the health of America tomorrow; it is therefore imperative to recognize and address health disparities in the earliest years of development. Infant mortality rates, which are linked to “maternal health, quality and access to medical care, socioeconomic conditions, and public health practices” (MacDorman & Mathews, 2008, p.1), often serve as a leading indicator of population health.

**Mississippi, the Nation, and Healthy People 2010**

Using the 1998 US rate of 7.2 infant deaths per 1,000 (or 27,287 total) live births as a baseline, Healthy People calls for 4.5 (or 2.7 fewer) infant deaths per 1,000 live births by 2010. As of 2005, the US infant mortality rate had only declined by 0.2 per 1,000 (to 7.0 deaths per 1,000) (DHHS, Healthy People 2010, n.d.c). Given the almost non-existent decline in infant mortality rates over recent years, the US is unlikely to achieve the remaining 2.5 per 1,000 fewer infant deaths necessary to meet the Healthy People target by 2010.

Meanwhile, Mississippi has consistently experienced worse rates of infant mortality than the nation. Similar to US trends but at higher levels, Mississippi rates have remained fairly stable in recent years (the 1998 rate of 10.2 per 1,000 live births rising slightly to 11.1 per 1,000 in 2005). Mississippi is thus even more unlikely to meet the Healthy People goal; in fact, the disparity between MS and US infant mortality is rising slightly.

**US infant mortality has barely decreased from the 1998 rate observed by Healthy People, while infant mortality in Mississippi increased slightly from 1998 to 2005.**
Mississippians: How Have We Compared?

From 1979 to 2005, white US females saw a fairly steady decline in infant mortality (from 9.8 to 5.2 infant deaths per 1,000 live births). Over this same period, rates for black Mississippi female infants were more than twice as high (falling from a rate of 20.5 per 1,000 in 1979 to a rate of 14.2 per 1,000 in 2005). 9 per 1,000 more black females died in 2005 because of higher mortality among black Mississippianas compared to national white females. In contrast, rates for white Mississippi females tracked very closely with the rates of their national counterparts (dropping from 10 to 5.3 per 1,000 between 1979 and 2005).

If we had achieved like the national rates in 2005, more than 1 in 2 deaths among black female infants in Mississippi would have been averted in 2005.

<table>
<thead>
<tr>
<th>Infant Mortality (per 1,000)</th>
<th>1979</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>12.7</td>
<td>6.4</td>
</tr>
<tr>
<td>MS white male</td>
<td>13.6</td>
<td>8</td>
</tr>
<tr>
<td>MS black male</td>
<td>26.8</td>
<td>19.8</td>
</tr>
<tr>
<td>US white female</td>
<td>9.8</td>
<td>5.2</td>
</tr>
<tr>
<td>MS white female</td>
<td>10</td>
<td>5.3</td>
</tr>
<tr>
<td>MS black female</td>
<td>20.5</td>
<td>14.2</td>
</tr>
</tbody>
</table>

NOTE: Measurements of equality employ national white data as the standard for comparison.
Black Mississippi males also experience infant mortality rates more than double those of their white national counterparts. From 1979 to 2005, white US male infant mortality dropped (from 12.7 to 6.4 per 1,000 live births) as did black MS male infant mortality (from 26.8 to 19.8 per 1,000). However, recent rates for black MS males are actually on the rise, and the disparity between US white and MS black males has increased accordingly. Meanwhile, like their female counterparts, white male rates in Mississippi track closely with white US male rates (dropping from 13.6 to 8 per 1,000 between 1979 and 2005).

NOTE: In tables, red data represent a worsening rate or percentage over the observed time period. Green data represent an improvement in rate or percentage.
PRETERM BIRTHS

Preterm birth, or birth before 37 weeks of gestation, is the primary cause of death among newborns (Centers for Disease Control and Prevention (CDC), n.d.). Premature infants face higher risk for low birth weight, breathing problems due to underdeveloped lungs, underdeveloped organs or organ systems, life-threatening infections, respiratory distress syndrome, cerebral palsy, and learning and developmental disabilities (National Institutes of Health (NIH), 2009). While many preterm health complications are immediate and transient, some appear only later in life while others persist throughout life. The severity of preterm birth effects on health corresponds to how early a baby is born (CDC, 2008).

Mississippi, the Nation, and Healthy People 2010

Using the 1998 US rate of 11.6% preterm births as a baseline, Healthy People calls for the reduction of preterm births (the rate of live births that occurred at less than 37 weeks of gestation) to 7.6%. Unfortunately, from 1998 to 2005, US rates for preterm births rose (to 12.7%). In Mississippi, from 1998 to 2005, preterm births even were higher (rising from 16.0% to 18.8%). Both the US and MS are moving away from the Healthy People goal. Moreover, the disparity between MS and the US is on the rise. In 2005 in Mississippi, 6.1% of preterm births and their accompanying risks could have been avoided if Mississippi achieved at national levels.

In 2005, almost 1 in 3 preterm births in Mississippi would have been averted if we had achieved like the nation.

Women at risk for preterm births include: those carrying multiple babies; previously experiencing preterm birth; having uterine or cervical problems; having chronic conditions such as high blood pressure or diabetes; experiencing certain infections; or smoking cigarettes, drinking alcohol, or using illicit drugs (CDC, n.d.).
Mississippians: How Have We Compared?

From 1998 to 2005, white US newborn males saw a steady increase in the number of preterm births (from 10.2% to 12.3%). White MS males saw higher rates of preterm births, and these rates also rose more rapidly (from 11.6% to 16.0%). Thus, disparities between preterm births among white MS males and white US males are rising. In fact, disparity between white males in Mississippi and the nation almost tripled over the observed period. Black MS males saw the highest rates of preterm birth of all observed groups (with preterm rates increasing from 20.2% in 1998 to 23.4% in 2005).

Female rates for preterm birth track closely to male patterns, but at slightly lower rates. From 1998 to 2005, white US newborn females saw a steady increase in the number of preterm births (from 9.1% to 11.1%). In Mississippi, white female rates were higher overall and rose much more quickly (from 10.4% to 14.8%). Disparity between white females in Mississippi and the nation tripled over the observed period. Meanwhile, rates for black MS females were much higher overall (rising from 20.3% to 22.7%).

“Approximately half of all excess deaths among African American children occur during infancy, primarily from extremely premature births” (Wise, 2004, p. 10).
“In 2005, the annual societal economic cost (medical, educational, and lost productivity) of preterm birth in the United States was at least $26.2 billion. The average first year medical costs were about 10 times greater for preterm than for full-term babies”

(CDC, n.d., Prematurity section, para. 3)

If black Mississippians (both male and female) had achieved at the white national rate in 2005, half of the preterm births in this population would have been averted.

Meanwhile, the disparity between white Mississippians (both male and female) and national whites tripled over the observed period.

<table>
<thead>
<tr>
<th>Infants Born Preterm</th>
<th>1995</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>10.2%</td>
<td>12.3%</td>
</tr>
<tr>
<td>MS white male</td>
<td>11.6%</td>
<td>16.0%</td>
</tr>
<tr>
<td>MS black male</td>
<td>20.2%</td>
<td>23.4%</td>
</tr>
<tr>
<td>US white female</td>
<td>9.1%</td>
<td>11.1%</td>
</tr>
<tr>
<td>MS white female</td>
<td>10.4%</td>
<td>14.8%</td>
</tr>
<tr>
<td>MS black female</td>
<td>20.3%</td>
<td>22.7%</td>
</tr>
</tbody>
</table>

Because we were not equal...

406 more white females in Mississippi
437 more white males in Mississippi
1056 more black males in Mississippi
1060 more black females in Mississippi

...were born preterm in 2005.
LOW BIRTH WEIGHT

Infants born with low birth weight (less than 2,500 grams) are at a higher risk for infant mortality. Moreover, these infants are also at higher risk for health and developmental problems for the rest of their lives (Child Trends Data Bank, n.d.). Disadvantages include higher risk of respiratory illnesses, neurosensory impairments, subnormal height, lower IQ and academic achievement scores, and failure to complete high school and postsecondary studies (Walter, Ehlenbach, Hotchkin, Chien, & Koepsell, 2009; Hack et al., 2002).

**Mississippi, the Nation, and Healthy People 2010**

Using the 1998 rate of 7.6% low birth weight as a baseline, Healthy People calls for the reduction of live births with low birth weight to 5% by 2010. Unfortunately, from 1998 to 2005, the US rate of low birth weight increased (to 8.2%). Similarly, over the 1998 to 2005 period, Mississippi rates rose (from 10.2% to 11.9%). Both the US and Mississippi are moving away from the Healthy People birth weight goal, with Mississippi experiencing higher rates and rising disparity compared to the nation.

“Risk factors for low and very low birth weight include smoking, low maternal weight gain or low pre-pregnancy weight, maternal or fetal stress, infections, and violence” (Child Trends Data Bank, n.d., Violence section, para. 1).

“The relationship between lifestyle risk factors and low birth weight is complex and is affected by psychosocial, economic, and biological factors. Cigarette smoking is the largest known risk factor for low birth weight... Pregnancy and the prospect of pregnancy provide an important window of opportunity to improve women’s health and the health of children. The adoption before or during pregnancy of more healthful lifestyle behaviors, such as ceasing to smoke, eating an adequate diet and gaining enough weight during pregnancy, and ceasing heavy drug use, can positively affect the long-term health of women and the health of their infants. Detrimental lifestyles can be modified, but successful modification will require large-scale societal changes. In the United States, these societal changes should include a focus on preventive health, family-centered workplace policies, and changes in social norms” (Chomitz, Cheung, & Lieberman, 1995, Intro section, para. 2).
Mississippians: How Have We Compared?

Newborns can be born at low weight for two reasons: a) growth during the intrauterine period has been impaired, although the duration of pregnancy may remain normal (small for gestational age); or b) the rate of intrauterine growth may be normal, but the length of gestation may be impaired (preterm birth, the more common cause). As discussed in our preface, low birth weight due to preterm birth carries serious risks in early life. Small for gestational age does not necessarily lead to risks experienced as a result of preterm birth, but low birth weight for gestational age does carry risks for early life, including increased risk of mortality, and significantly, low birth weight for gestational age carries risk of long-term health effects, such as increased risk of cognitive disorder and differences in academic achievement and professional attainment (Kok, 1998; Strauss, 2000).

Black Mississippians are particularly disadvantaged in birth weight. From 1995 to 2005, low birth weight due to preterm birth rose slightly among white US males (from 3.9% to 4.7%) and among white MS males (from 4.3% to 5.7%), the more rapid rise among white MS males creating an increased disparity. As a result, 1% more white males in Mississippi experienced low birth weight due to preterm birth in 2005 compared to the nation. Rates and patterns were very similar for white females, with rates of low birth weight due

If Mississippians had achieved like the nation in 2005, 1 in 3 cases of low birth weight would have been averted in Mississippi.
to preterm birth rising slightly for white US females (from 3.9% to 4.9%) and white MS females (from 4.3% to 6%), an increasing disparity between the two groups reaching 1.1% in 2005.

Meanwhile, rates of low birth weight due to preterm birth among black males and females are more than double white rates. Rates for black males rose slightly more rapidly (from 8.2% to 10.6%) than rates for black females (from 9.5% to 11.2%). However, over the entire observed period, black females saw higher rates and greater disparity from their white national counterparts. In 2005, 6.3% more black females in Mississippi suffered low birth weight due to preterm birth compared to their white national counterparts, while 5.9% more black males in Mississippi suffered the same.

Overall, roughly 1 in every 2 cases of low birth weight due to preterm birth among black Mississippians (male and female) would have been averted, if we achieved like the nation. In addition, a reversal of typical patterns shows that females, generally the healthier sex, experience slightly higher rates of low birth weight than males. Very similar patterns are observed for low birth weight for gestational age.

<table>
<thead>
<tr>
<th>Infants With Low Birth Weight Due to Preterm Birth</th>
<th>1995</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>3.9%</td>
<td>4.7%</td>
</tr>
<tr>
<td>MS white male</td>
<td>4.3%</td>
<td>5.7%</td>
</tr>
<tr>
<td>MS black male</td>
<td>8.2%</td>
<td>10.6%</td>
</tr>
<tr>
<td>US white female</td>
<td>3.9%</td>
<td>4.9%</td>
</tr>
<tr>
<td>MS white female</td>
<td>4.3%</td>
<td>6.0%</td>
</tr>
<tr>
<td>MS black female</td>
<td>9.5%</td>
<td>11.2%</td>
</tr>
</tbody>
</table>

Roughly 1 in 6 cases of low birth weight due to preterm birth among white Mississippi males would have been averted in 2005, if we achieved like the nation.

Roughly 1 in 5 cases among white females would have been averted.

In low-income countries, removal of infants from low birth weight status is estimated to incur a $510 economic benefit per infant due to reduced medical costs and mortality rates and increased learning and productivity

(Alderman & Behrman, 2006).
Rates for white males and females remained fairly stable, with white male rates at 1.8% in 1995 and 1.9% in 2005 and US white female rates at 2.6% and 2.8%. Almost no difference existed between white males in Mississippi and across the nation. However, in 2005, 0.6% more white females in Mississippi experienced low birth weight for gestational age.

As with low birth weight due to preterm, prevalence rates of low birth weight for gestational age among black males and females are double white US rates. Rates for black males rose (from 3.1% to 4.1%) to create a disparity of 2.2% compared to white US males, and rates for black females rose (from 5.2% to 6%) to create a disparity of 3.2%.

**Black US infants of US-born mothers are at greater risk to be small for gestational age than black US infants whose mothers were foreign-born. These and similar findings undermine theories that lower birth weights among black infants (compared to white infants) reflect normal physiological differences**

(Kramer, Ananth, Platt, & Joseph, 2006).

<table>
<thead>
<tr>
<th>Infants With Low Birth Weight for Gestational Age</th>
<th>1995</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>1.8%</td>
<td>1.9%</td>
</tr>
<tr>
<td>MS white male</td>
<td>2.1%</td>
<td>2.0%</td>
</tr>
<tr>
<td>MS black male</td>
<td>3.1%</td>
<td>4.2%</td>
</tr>
<tr>
<td>US white female</td>
<td>2.6%</td>
<td>2.7%</td>
</tr>
<tr>
<td>MS white female</td>
<td>3.2%</td>
<td>3.4%</td>
</tr>
<tr>
<td>MS black female</td>
<td>5.2%</td>
<td>6.0%</td>
</tr>
</tbody>
</table>

More than **1 in 6 cases** of low birth weight for gestational age among **white female Mississippians** would have been averted in 2005, if we achieved like the nation.
More than 1 in 2 cases of low birth weight for gestational age among black Mississippians (male and female) would have been averted in 2005, if we achieved like the nation.

“The reduction of low birthweight rates poses a challenge for public health programs, as standard prenatal interventions have not generally shown success at increasing birthweights among infants born to high risk women. [A study of Colorado’s Prenatal Plus program shows] the effectiveness of enhanced services for pregnant women when these services are targeted toward the resolution of specific risk factors that are known to be associated with low birthweight, such as smoking, inadequate weight gain, and psychosocial problems”

“Maternal health and the availability of prenatal care influence children’s birth weights, which in turn affect children’s likelihood of dropping out. Students who weighed less than 5.5 pounds at birth are about 33 percent more likely to drop out of school; this is true even when comparisons are made among siblings growing up in the same household” (The Annie E. Casey Foundation (AECF), 2009, p. 3).

Studies on dropout rates have found causal factors extending far beyond the classroom. Factors affecting dropout rates include gender, race and ethnicity, and income. Among those at highest risk are economically-disadvantaged African-American or Hispanic males. Disadvantaged communities see higher rates of health and psychological issues that can retard educational developments. Poor families see reduced access to nutrition, health services, good schools, and learning resources. Moreover, children born in disadvantaged conditions experience higher levels of stress, these effects even extending to actual memory impairment (AECF, 2009).

Findings on risk factors for dropping out and resulting implications for effective intervention are often surprising. For example, poverty in the earliest years of childhood actually has greater impact on likelihood to drop out, compared to poverty in later years of childhood and adolescence. Extremely early life factors have significant effects on risks of dropping out, and effective interventions can reach all the way back to prenatal care (AECF, 2009).
Dropout percentages are falling in Mississippi and across the nation. In 2000, 15% of teens in Mississippi were high school dropouts, 4% more than national average. However, over the last decade, dropout percentages have fallen more rapidly in Mississippi compared to the nation, and in 2007, Mississippi saw a teen dropout percentage of 8%, only 1% above the national average (AECF, n.d.).

“In 2007, Mississippi implemented The Mississippi State Dropout Prevention Plan, with the goals of increasing the graduation rate to 85% by 2018-2019, reducing the state dropout rate by 50% by 2011-2012, and reducing the statewide truancy rate by 50% by 2011-2012. In order to reach these goals, the State Plan will be following the National Dropout Prevention Center/Network’s 15 Effective Strategies for Dropout Prevention” (MS Kids Count Data Book, 2008, p.110).

“Two statewide Dropout Prevention Summits were held in Mississippi where a teen panel discussed issues related to dropping out, and community leaders discussed local dropout prevention initiatives. To augment this program, a dropout awareness campaign called “On the Bus” has been implemented by the Department of Education. The campaign features TV commercials as well as radio and print ads, and it seeks to shed light on the major disadvantages Mississippi students face when they drop out of school. In addition, it highlights the costs for Mississippi taxpayers. The “On the Bus” Web site is a resource for students, parents of children who are at-risk, and people in the community who want to help out” (AECF, 2008, p.110).
In order to limit the incidence of preventable diseases, Healthy People 2010 outlines targets for immunizations of infants and young adults.

**DIPHTHERIA, TETANUS, & PERTUSSIS**

The DTaP vaccine protects against three bacterial infections: Diphtheria, Tetanus (“lockjaw”), and Pertussis (“whooping cough”). Children should receive doses of DTaP at 2 months, 4 months, 6 months, 15-18 months, and 4-6 years (CDC, 2007a).

**Mississippi, the Nation, and Healthy People 2010**

Using the 1998 rate of 84% of children 19 to 35 months receiving the first 4 doses of DTaP as a baseline, Healthy People calls for achievement of DTaP vaccination by 90% of children 19 to 35 months by 2010, representing a 6% improvement. From 1998 to 2007, rates of DTaP immunization varied for the nation, averaging around 83.8% and showing no true trend either upwards or downwards. Mississippi rates fluctuated even more sharply than US rates, with an average of 84.4% of Mississippi children received the recommended vaccinations for DTaP, representing a 0.6% advantage over the nation. **Neither MS nor the US appears to be approaching the HP2010 target.**
**Immunization & Incidence**

On average over the 1998 to 2007 period, Mississippi children aged 19 to 35 months received recommended DTaP vaccination at a rate of 0.6% higher than the nation. However, in both 2006 and 2007, the Mississippi rate of vaccination was well below the national rate.

**Incidence**

Healthy People 2010 calls for 0 cases of Diphtheria (for persons under 35 years), 0 cases of Tetanus (for persons under 35 years), and a reduction in Pertussis cases to 2,000 (for children under 7 years). From 1998 to 2006, Mississippi did not see a single case of Diphtheria, meeting the HP2010 target in all years and outperforming the US, which only attained 0 cases of diphtheria from 2004 onwards.

Mississippi also met the Healthy People goal for Tetanus for most of this period with the possible exception of the years from 2001 to 2003, years in which only 1 case of Tetanus (age of infected person unknown) was reported. In comparison, the US failed to meet or approach the 2010 Tetanus target at any time over the observed period, with reported cases that ranged from 41 in 1998 to 20 in 2003 and back to 41 in 2006.

---

Diphtheria is a respiratory infection which creates a thick membrous covering in the back of the throat. Diphtheria can cause respiratory problems, paralysis, heart failure, and even death.

Tetanus infections cause painful tightening of muscles all over the body, including locking of the jaw such that a victim cannot open his or her mouth or swallow. 1 out of 5 tetanus cases result in death.

Pertussis infections cause severe coughing which can interfere with eating, drinking, and breathing in infants. Pertussis can lead to pneumonia, seizures, brain damage, and death (CDC, 2007). (Image provided by CDC, 1995.)
The US failed to meet or approach the HP2010 goal for Pertussis as well, with case rates for children under seven years exceeding the target in every year and overall rates rising sharply from 7,405 in 1998 to 25,827 in 2004 before dropping slightly to 15,632 in 2006.

Given that the Healthy People goal for all US children under seven is 2,000 cases, the goal for Mississippi, based on Mississippi’s population size in comparison to that of the US, can be approximated as 20 cases.

The National Notifiable Disease Surveillance System (NNDSS) only reports age-based data for national incidence rates, so Mississippi’s performance in Pertussis incidence according to the Healthy People goal for children aged 19 to 35 months is difficult to assess.

However, the number of cases of Pertussis for all age groups have increased greatly in Mississippi. Mississippi, which only had 5 reported cases in 2001, saw Pertussis incidence peak at 62 in 2005 before falling back to 37 cases in 2006.

While it is clear that Mississippi had achieved the Healthy People goal in the early part of the decade, recent increases in Pertussis incidence most likely place Mississippi outside of the Healthy People goal for incidence amongst children and definitely represent a disturbing trend.

However, Mississippians represent 1% of the US population, while the percentage of Pertussis cases occurring in Mississippi at its highest only reaches 0.24% of national case totals. Hence, Mississippi is greatly outperforming the nation in reducing Pertussis incidence.

Early vaccination prevents diseases with extremely serious impacts on child health from affecting our population.

These diseases carry high risk for hospitalization and death in younger age cohorts. (Image provided by CDC, and James Gathany, 2006.)
**H. influenzae type B**

*Haemophilus influenzae* type B causes various infection-based illnesses, the most pernicious being bacterial meningitis in young children, which can result in permanent brain damage or death. Before the *H. influenzae* type B (Hib) vaccine became available, 20,000 children a year experienced severe Hib disease, with 1,000 yearly deaths (CDC, 1998). “Due to routine use of the Hib conjugate vaccine since 1990, the incidence of Hib disease in infants and young children has decreased by 99% to fewer than 1 case per 100,000 children under 5 years of age” (CDC, 2008a, para. 2).

**Mississippi, the Nation, and Healthy People 2010**

Healthy People 2010 targets achievement of Hib vaccination by 90% of children age 19 to 35 months by 2010; the nation had already achieved this target at the time the goal was set. National rates for Hib vaccination exceeded the Healthy People target throughout the 1998 to 2007 period, and saw no trend either upward or downward (at 93% in 1998 and 92.6% in 2007).

Mississippi also began this period with vaccination rates higher than the Healthy People target, our rates higher even than national rates. However, by 2007 Mississippi children (with a rate of 86.6%) trailed the nation by 6% in Hib immunization, Mississippi rates falling further and further away from the Healthy People target. The drop in Hib vaccination among Mississippi children has dangerous implications for the future.
Incidence

Healthy People 2010 aims for 0 Hib cases in children under the age of 5. The US has failed to achieve or even approach the Hib incidence target. Moreover, overall US Hib incidence (all age groups) has increased steadily, from 1,194 to 2,436 from 1998 to 2006.

The National Notifiable Disease Surveillance System only reports age-based data for national incidence rates, so Mississippi’s progress towards the Healthy People goal for children aged 19 to 35 months cannot be assessed.

However, overall Mississippi rates remained fairly stable at 2 cases for most years, with the exception of 0 cases in 2005 and two spikes in incidence in 2002 and 2006 (10 and 13 cases, respectively).

While these spikes were large compared to Mississippi’s normal rates, Mississippi outperformed the nation every year. In no year from 1998 to 2006 did Mississippi incidence make up more than 0.57% of the national cases – well below the 1% expected based on Mississippi’s population.

While the US met the Healthy People target for *H. influenzae* type B immunization of children, it failed to meet goals for the reduction of Hib incidence. Hib incidence across the nation is increasing for all ages.

Mississippi began the observed period outperforming the nation in Hib immunization but is now falling further and further below national vaccination rates and the Healthy People goal. However, Mississippi is actually bettering the nation in Hib incidence.

Reducing rates of immunization in Mississippi could predict a coming increase in Hib incidence for our state.
HEPATITIS B

Hepatitis B is a serious disease that can cause liver damage, liver cancer, and death. Children are at higher risk for chronic HepB infections. Since HepB vaccination became routine in 1991, reported HepB incidence among children and adolescents dropped by 95% (CDC, 2007b).

Mississippi, the Nation, and Healthy People 2010

Using the 1998 rate of 87% as a baseline, Healthy People calls for HepB vaccination of 90% of infants by 2010. From 1998 to 2007, US vaccination rates rose fairly steadily (from 87% to 92.7%), meeting and exceeding the Healthy People goal.

Mississippi performed similarly to the US, beginning with a rate in 1998 (of 89.8%) that was actually 2.8% higher than the national immunization rate and only 0.2% short of the HP2010 target. Since then, Mississippi rates tracked very closely with national rates. In 2007, (with a rate of 94.2%) Mississippi held a 1.5% advantage over the nation in HepB immunization and, like the US, achieved the Healthy People goal.

Rates of vaccination for Hepatitis B among children 19 to 35 months old (both nationally and in Mississippi) are on the rise and have exceeded the Healthy People goal.

Hepatitis B incidence overall is dropping sharply for the nation and for Mississippi.
Overall incidence of Hepatitis B has declined sharply across the nation, from 10,258 cases in 1998 to 4,713 cases in 2006.

In Mississippi, HepB incidence hovered around 100 cases from 1998 to 2004 but declined significantly in 2005 and 2006, with 53 cases and 13 cases, respectively.

Based on population, cases of HepB in Mississippi should only represent 1% of total HepB cases across the nation in a given year. By this standard, Mississippi had a disproportionately large number of cases of HepB in the early part of the decade. In 1999, Mississippi’s HepB cases accounted for 1.69% of the cases occurring throughout the nation.

However, Hepatitis B incidence in Mississippi dropped sharply in the latter years of the decade, and in 2006, Mississippians only represented 0.28% of Hepatitis B cases.

"From time to time, rumors circulate that thimerosal, a mercury-based preservative once used in several vaccines (and still used in some flu vaccines), could contribute to ASDs [autism spectrum disorders]. However, valid scientific studies have shown there is no link. The American Academy of Pediatrics (AAP), the American Medical Association (AMA), the CDC, and the Institute of Medicine (IOM) agree that science does not support a link between thimerosal in vaccines and autism” (AAP, n.d., What about Vaccine Safety?, para 2).

In 1997, a controversial English study suggested a link between infant MMR vaccinations and the onset of autism in children. Since then, parents of autistic children and activists have responded by challenging the legality of mandatory vaccinations and the chemical content of vaccines. However, no subsequent medical studies have found a significant connection between vaccinations and the onset of autism, and the medical community is in consensus on the safety of childhood vaccinations with relation to autism (Baker, 2007). Unfortunately, the persistent rumor connecting the MMR vaccination and autism may contribute to falls in rates of MMR immunization.
MEASLES, MUMPS & RUBELLA

The Measles, Mumps, and Rubella (MMR) vaccination protects against three highly contagious diseases: measles, mumps, and rubella. These have the potential for a variety of serious consequences such as brain damage (measles), deafness (mumps), death (measles and mumps), and miscarriage and congenital anomalies (rubella). The MMR is administered in two doses, the first at 12-15 months, and the second at 4-6 years of age (CDC, 2008b).

Mississippi, the Nation, and Healthy People 2010

Healthy People calls for achievement of the first dose of MMR by 90% of children aged 19 to 35 months in 2010. From 1998 to 2007, US rates of vaccination have held fairly steady, at roughly 92%, always exceeding the Healthy People target.

Mississippians, although initially achieving above the 2010 target (with rates as high as 94.7% in 2003), have seen a recent decline in MMR vaccinations.

As a result, in 2007, Mississippians fell short of the nation by 5.1% and fell short of the Healthy People target by 2.8%.
Incidence

Healthy People 2010 calls for 0 cases of measles, mumps, and rubella by 2010. From 1998 to 2006, Mississippi did not have any cases of measles or rubella, achieving the Healthy People goal, where the US did not. However, US measles cases reduced from 100 to 55 and US rubella cases reduced from 364 to 11, nearing the Healthy People goal.

Meanwhile, Mississippi only met the HP2010 target for mumps in 2000 and 2004. However, incidence of mumps in Mississippi was consistently lower than expected (given US rates) from 2003 onwards. In 2006, Mississippi only contributed to 0.03% of national mumps cases, well below the population-based expectation of 1%.

However, recent reductions in MMR vaccinations in Mississippi could lead to a resurgence of mumps in coming years, similar to the large surge in US rates from 314 mumps cases in 2005 to 6,594 cases in 2006.

The CDC used the Wellbee character in a series of marketing campaigns beginning with an oral-polio campaign.

Wellbee went on to promote diphtheria and tetanus immunization, as well as hand-washing, physical fitness, and injury preventions. (Image provided by CDC, 1963.)
POLIO

Polio is a viral disease that can cause paralysis and even death. Prior to the emergence of a vaccine in 1955, more than 20,000 cases of polio occurred each year. Now, the vaccine has all but eradicated polio in the developed world. The inactive polio vaccine is recommended to be administered at 2 months, 4 months, and 6-18 months, with a booster dose administered at 4-6 years of age (CDC, 2000).

Mississippi, the Nation, and Healthy People 2010

Healthy People calls for a polio vaccination rate in children aged 19 to 35 months sustained at 90% by 2010. From 1998 to 2007, the US vaccination rate rose overall (from 90.8% to 92.6%), meeting and exceeding the Healthy People goal.

Mississippi vaccination rates also rose from 1998 to 2005 (from 91.8% to 94.8%). However, though still exceeding the Healthy People goal, since 2005, Mississippi vaccination rates have fallen (to 90.9% in 2007). This trend bears watching. Neither MS nor the US has seen a case of polio from 1998 to 2006, with the exception of 1 US case in 1998.
VARICELLA

Varicella zoster virus causes the common childhood disease of chickenpox, which is characterized by blisters found all over the body and fever. While chickenpox is usually mild, it is highly contagious and can lead to complications such as skin infection, pneumonia, brain damage, or even death. Before vaccination became available in 1995, roughly 11,000 people were hospitalized and roughly 100 people died each year from chickenpox. The recommended varicella vaccine is administered in two doses, at 12-15 months and 4-6 years of age (CDC, 2008c).

Mississippi, the Nation, and Healthy People 2010

Using the 1998 US baseline of 43.0% of children aged 19 to 35 months receiving varicella vaccinations, Healthy People calls for an increase in vaccination to 90% by 2010. By 2007, the US rate had more than doubled (90%), meeting the Healthy People goal.

While Mississippi began the observed period far behind the nation (with 15.5% fewer immunized children), Mississippi rates of varicella vaccinations rose even more rapidly (springing up from 27.7% in 1998 to 88.4% by 2007), so that in recent years our rates either exceeded national rates or tracked closely beneath them. Mississippi will likely reach the Healthy People target by 2010.
### Estimated Effects of DTaP Vaccination in 2001

<table>
<thead>
<tr>
<th>Vaccination</th>
<th>Lives Saved</th>
<th>Dollars Saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria vaccination</td>
<td>24,721</td>
<td>$24.9 billion</td>
</tr>
<tr>
<td>Tetanus vaccination</td>
<td>8</td>
<td>$28 million</td>
</tr>
<tr>
<td>Pertussis vaccination</td>
<td>1,008</td>
<td>$3.55 billion</td>
</tr>
</tbody>
</table>

Cost of illness includes direct medical cost as well as societal costs, such as missed work days, low performance quality, and future health complications (Zhou et al., 2005).

### Estimated Effects of H. influenza type B Vaccination in 2000

<table>
<thead>
<tr>
<th>Cost of vaccination</th>
<th>Direct Costs</th>
<th>Societal Costs (direct plus indirect)</th>
</tr>
</thead>
<tbody>
<tr>
<td>program</td>
<td>$0.39 billion</td>
<td>$0.48 billion</td>
</tr>
<tr>
<td>no program existed</td>
<td>$1.35 billion</td>
<td>$2.58 billion</td>
</tr>
</tbody>
</table>

Direct costs relate to treatment for the disease and any complications. Indirect costs address loss of productivity due to premature loss of life, disability, missed work, etc. (Zhou et al., 2002).

### Estimated Effects of HepB Vaccination in 2001

<table>
<thead>
<tr>
<th>Vaccination</th>
<th>Lives Saved</th>
<th>Dollars Saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>HepB vaccination</td>
<td>3,024</td>
<td>$1.12 billion</td>
</tr>
</tbody>
</table>

Cost of illness includes direct medical cost as well as societal costs, such as missed work days, low performance quality, and future health complications (Zhou et al. 2005).

### Estimated Effects of MMR Vaccination in 2001

<table>
<thead>
<tr>
<th>Vaccination</th>
<th>Lives Saved</th>
<th>Dollars Saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles vaccination</td>
<td>2,794</td>
<td>$5.87 billion</td>
</tr>
<tr>
<td>Mumps vaccination</td>
<td>11</td>
<td>$1.46 billion</td>
</tr>
<tr>
<td>Rubella vaccination</td>
<td>14</td>
<td>$380 million</td>
</tr>
</tbody>
</table>

Cost of illness includes direct medical cost as well as societal costs, such as missed work days, low performance quality, and future health complications (Zhou et al., 2005).

### Estimated Effects of Polio Vaccination in 2001

<table>
<thead>
<tr>
<th>Vaccination</th>
<th>Lives Saved</th>
<th>Dollars Saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polio vaccination</td>
<td>723</td>
<td>$4.89 billion</td>
</tr>
</tbody>
</table>

Cost of illness includes direct medical cost as well as societal costs, such as missed work days, low performance quality, and future health complications (Zhou et al., 2005).

### Estimated Effects of Varicella Vaccination in 2001

<table>
<thead>
<tr>
<th>Vaccination</th>
<th>Lives Saved</th>
<th>Dollars Saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chickenpox vaccination</td>
<td>57</td>
<td>$993 million</td>
</tr>
</tbody>
</table>

Cost of illness includes direct medical cost as well as societal costs, such as missed work days, low performance quality, and future health complications (Zhou et al., 2005).
Unlike in many other areas of child health, there are not many marked disparities between Mississippi and the nation in vaccination rates (the exceptions being very recent rates of Hib and MMR vaccination). In Mississippi, children are required to receive DTaP, IPV, HepB, MMR, and Varicella vaccinations in order to enter public school (Mississippi Department of Health (MSDH), 2009a; MSDH, 2009b). These same vaccinations are required for entry into any licensed childcare facility in the state, with the additional requirements of Hib and PCV7 vaccination (MSDH, n.d.a). The lack of major disparity in vaccination rates points to the efficacy of using the school system as a point of health intervention.

The federally-funded Vaccines for Children Program provides free vaccines to children who meet eligibility requirements. This program is another likely reason for minimal disparities in child vaccination in Mississippi. However, the question of why Hib and MMR immunizations have fallen in the last couple of years in Mississippi remains unanswered.
CHILDHOOD OBESITY

“As of July 2009, Mississippi officially had the highest rates of both childhood and adult obesity in the nation”

(Mississippi Department of Education’s Office of Healthy Schools, n.d., p. 4).

OVERWEIGHT & OBESITY

Overweight and obesity are defined as at or above the sex and age specific 95th percentile of Body Mass Index (BMI). “Overweight and obesity substantially raise the risk of illness from high blood pressure, high cholesterol, type 2 diabetes, heart disease and stroke, gallbladder disease, arthritis, sleep disturbances and problems breathing and certain types of cancers” (DHHS, n.d.a, Health Impact of Overweight and Obesity, para. 1). Mississippi adults have led the nation in rates of obesity since 2005 (Mississippi Department of Education’s Office of Healthy Schools, n.d.). Obesity-related deaths are on the rise in the United States, and are particularly high in Mississippi.

Mississippi also leads the nation in childhood obesity, with 6.9% more overweight children compared to the second leading state (this is the largest margin between states for this measure). Approximately 80% of overweight adolescents will become overweight adults (Mississippi Department of Education’s Office of Healthy Schools, n.d.). Childhood obesity can also portend social and psychological problems, joint problems, early onset of diabetes, and cardiovascular disease. Children are even seeing rising rates of high blood pressure (CDC, 2008d).

However, obesity is a disease that can be theoretically thwarted, especially if interventions begin in early childhood. This disease is preventable and manageable with exercise, healthy eating habits, and overall nutritional education, although effective programs of prevention or treatment are very uncommon.

“Obesity is a result of social, behavioral, cultural, environmental, physiological, and genetic factors” (DHHS, n.d.b).
Mississippi, the Nation, and Healthy People 2010

Healthy People calls for a reduction of the percentage of overweight and obesity to 5% among all youth categories by 2010, including adolescents aged 12 to 19 years.

Unfortunately, US youth in grades 9-12, have instead seen increasing rates of overweight and obesity (rising from 25% in 1999 to 29% in 2007) (CDC, Youth Risk Behavior Surveillance System (YRBSS), n.d.d). In Mississippi, rates are even higher and have seen an even sharper increase (from 30% in 1999 to 36% in 2007). Thus, disparities are growing between Mississippi and the nation in obesity and overweight, and both are moving away from the Healthy People goal.

Mississippians: How Have We Compared?

From 1999 to 2007, overweight and obesity increased slightly among white US females in grades 9-12 (from 19% to 20%). In comparison, rates of overweight and obesity increased much more rapidly in Mississippi. Rates for white MS females, which were better than US rates in 1999 (14%), leaped upwards, and in 2007 rates for white females in Mississippi (at 22%) exceeded white US rates by 2%.

As of the 2007-2008 school year, full calorie, sugared carbonated soft drinks were no longer sold to Mississippi school students during the day, and as of the 2008-2009 school year, only select beverages options were made available through school vending machines (Mississippi State Department of Health, 2007).

NOTE: Healthy People 2010 objectives are based on the National Health and Nutrition Examination Survey. The data herein derives from the Youth Risk Behavior Surveillance System.
Black females in Mississippi experienced the greatest rates of overweight and obesity. The percentage of black females in MS who were overweight in 1999 (34%) was 15% higher than the rate for white females in the US. This rate also increased more rapidly than the US rate, and by 2007, overweight and obesity among black MS females (45%) was 25% higher than the white US rate.

Patterns differ for males over the 1999 to 2007 period. White males in the US saw rates of overweight and obesity rise (from 27% to 30%) while Mississippian saw the rate remain stable (35%). However, this pattern still left white MS males with 5% more incidence of obesity and overweight. Meanwhile, rates for black males in MS were higher and climbed more quickly (from 35% to 41%) than rates for white US males, resulting in 11% more overweight and obese black Mississippians compared to US whites in 2007.

<table>
<thead>
<tr>
<th>Overweight or Obese Youth</th>
<th>1999</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US white male</strong></td>
<td>26.9%</td>
<td>30.3%</td>
</tr>
<tr>
<td><strong>MS white male</strong></td>
<td>34.9%</td>
<td>35.3%</td>
</tr>
<tr>
<td><strong>MS black male</strong></td>
<td>34.9%</td>
<td>40.8%</td>
</tr>
<tr>
<td><strong>US white female</strong></td>
<td>18.6%</td>
<td>19.6%</td>
</tr>
<tr>
<td><strong>MS white female</strong></td>
<td>14.3%</td>
<td>21.7%</td>
</tr>
<tr>
<td><strong>MS black female</strong></td>
<td>34.3%</td>
<td>45.1%</td>
</tr>
</tbody>
</table>

Because we were not equal...

- 2.1% more young white females in Mississippi
- 5% more young white males in Mississippi
- 10.5% more young black males in Mississippi
- 25.5% more young black females in Mississippi

...were overweight or obese in 2007.
“Understanding the causes of childhood obesity can provide the opportunity to focus resources, interventions and research in directions that would be most beneficial in addressing the problem…” (DHHS, n.d.b, para 5).

“The causes of childhood obesity are multi-factorial. Overweight in children and adolescents is generally caused by a lack of physical activity, unhealthy eating patterns resulting in excess energy intake, or a combination of the two. Genetics and social factors – socio-economic status, race/ethnicity, media and marketing, and the physical environment – also influence energy consumption and expenditure. Most factors of overweight and obesity do not work in isolation and solely targeting one factor may not make a significant impact on the growing problem” (DHHS, n.d.b, para 6).

“To date, research has been unable to isolate the effects of a single factor due to the co-linearity of the variables as well as research constraints. Specific causes for the increase in prevalence of childhood obesity are not clear and establishing causality is difficult since longitudinal research in this area is limited. Such research must employ long study times to discern if there is an interaction of factors leading to an increase in the prevalence or the prevention of obesity during childhood and adolescence. Underreporting total food intake, misreporting of what was eaten, and over reporting physical activity are all likely potential biases that may affect the outcomes of studies in this area” (DHHS, n.d.b, para 7).

“Findings from studies suggest that the effects of race/ethnicity and SES on the prevalence of childhood obesity cannot be individually determined because they are collinear. Therefore evidence is often inconsistent as a result of the difficulty of separating the overlapping factors. Furthermore, the relationship among race/ethnicity, SES, and childhood obesity may result from a number of underlying causes, including less healthy eating patterns (e.g., eating fewer fruits and vegetables, more saturated fats), engaging in less physical activity, more sedentary behavior, and cultural attitudes about body weight. Clearly these factors tend to co-occur and are likely to contribute jointly to differentials in increased risk of obesity in children” (DHHS, n.d.b, Socio-Economic Status and Race/Ethnicity section, para. 2).
The Mississippi Department of Education (MDE), Office of Healthy Schools (OHS), established in 2004, tallies and oversee efforts to combat childhood obesity. The OHS awards 1) one-year start-up grants to form and assess School Health Councils that can implement a variety of health interventions; 2) three-year grants, along with technical assistance, for school districts to implement the Coordinated School Health Program; 3) grants for schools to purchase kitchen equipment to increase fruit and vegetable consumption; and 4) grants for schools to create curriculums, training, and resources in accordance with the Mississippi Healthy Student’s Act of 2007. The OHS also conducts a recognition program for schools with excellent physical education programming and coordinates implementation of two national programs, The State Nutrition Action Plan (SNAP) and Action for Healthy Kids, at the state level (MSDH, 2007; Mississippi Department of Education’s Office of Healthy Schools, n.d.).

Schools have also successfully sought funding for health programs from a variety of other sources, federal, state, and private. These initiatives aim to improve child health by improving food available in schools, educating students and families about healthful decisions, increasing the amount of and attention for physical education at school, and providing assessments for how individual schools can improve. Several community initiatives also exist, which aim to curb childhood obesity by promoting healthy foods, daily exercise, and studying the health of Mississippi children. Several of these community initiatives also involve implementing national or state programs. One major example is Blue Cross & Blue Shield’s Let’s Go Walkin’ Mississippi Campaign. Meanwhile, the University of Southern Mississippi’s College of Health has initiated several research projects on child obesity and intervention efficacy, and Mississippi State University’s Extension Service is involved in the implementation of a variety of nutrition and fitness intervention and education programs. (MSDH, 2007).

Additional recommendations for improving childhood obesity include: increasing numbers of health educators, improving training of health educators, targeting pre-K children with obesity-education materials, funding more grassroots organizations, encouraging community access to physical activity and nutrition education facilities, and equitably providing green space and healthy outlets for underprivileged children (MSDH, 2007).

Recent attention to childhood obesity and obesity in Mississippi has resulted in relatively good funding for these programs. However, Mississippi needs to find long-term sources for funding so that these health programs do not go unfunded when obesity falls from prominence in the issue-attention cycle.

Finally, while grassroots efforts have a place in targeted improvement of community health, a uniformly-implemented, state-wide program to combat obesity may be more effective than the current patch-work approach (MSDH, 2007).
Physical activity is key in addressing obesity in the youth population. However, what constitutes meaningful physical activity with regards to effective weight loss is not completely understood. Moreover, measures of physical activity are typically self-reported, and this data is often unreliable due to difficulties of definition and recall. One of the least fraught measures of physical activity among youth is school participation in physical education.

The Department of Health and Human Services recommends that youth participate in at least 60 minutes of physical activity per day. In order to promote more frequent physical activity amongst youth, policies have been developed to promote school physical education programs.

**Mississippi, the Nation, and Healthy People 2010**

Using the 1999 US baseline of 29%, Healthy People calls for an increase in participation in daily physical education classes to 50% of students in grades 9-12 by 2010. From 1999 to 2007, the US rate of participation in daily physical education fluctuated but remained largely unchanged (around 30%), falling far short of the Healthy People goal.
Mississippi rates were lower than national rates and rose only slightly from 1999 to 2007 (from 20.3% to 23.4%). As a result, Mississippi trailed the nation by almost 7% in daily participation in physical education in 2007, and neither the United States nor Mississippi are approaching the Healthy People target.

**Mississippians: How Have We Compared?**

Overall, from 1993 to 2007, participation in physical education (PE) has dropped among white males (from 34.8% to 32.2%) and females (from 29.1% to 25.6%) across the nation. By contrast, rates of daily participation in physical education rose for Mississippians. Black males in Mississippi actually saw rates of participation above white national rates for the majority of the period (rates rising from 30.7% to 32.2%) and females (from 29.1% to 25.6%) across the nation. By contrast, rates of daily participation in physical education rose for Mississippians.

Black males in Mississippi actually saw rates of participation above white national rates for the majority of the period (rates rising from 30.7% to 33.9%), while white MS male rates rose above white national rates twice over the observed period and have shown a general upward trend (19.6% to 27.6%).

Females in Mississippi saw lower rates of participation compared to their white national counterparts. However, in contrast to national female trends, rates for black females in Mississippi rose (from 14.3% to 21.5%), as did rates for white females (from 7.7% to 10.5%).

There is little correlation between childhood obesity and daily physical education participation. Males suffer obesity at greater rates, but males participate in daily PE at greater rates. Black males and females suffer obesity at greater rates, but black males and females see higher rates of daily PE (black males exceeding the national white rates). These discrepancies result from either 1) inaccuracy of “daily participation in PE” as a true measure of physical activity, 2) over-prioritization of physical activity as a method to address obesity, or 3) a lag in cause and effect, i.e. trends in physical activity may be reflected in future rates of child obesity.
Visceral fat lies within the abdominal cavity surrounding the organs; it is unnoticeable to the naked eye and can only be seen through the use of an MRI. Individuals with large amounts of visceral fat are at a greater risk for several diseases (UAB Media Relations, 2009). (More effects of visceral fat are discussed elsewhere in this publication.) Visceral fat begins to accumulate in early childhood, and this fat increases a child’s risk for adult diseases such as Type 2 diabetes and cardiovascular disease (Shepard, 1998). While diet is crucial to overall weight loss, exercise is crucial to control visceral fat (UAB Media Relations, 2009).

TYPE 2 DIABETES IN CHILDHOOD

Type 2 diabetes occurs when cells of the body become insulin-resistant, resulting in a failure to uptake sugar and convert it into energy. The excess sugar remains in the blood stream, leaving the body low on energy and at risk to nerve and blood vessel damage which eventually results in serious health difficulties such as heart disease, stroke, and kidney disease (American Diabetes Association (ADA), n.d.; MSDH, n.d.b). In 2002, more than 270,000 Mississippians (about 8.6% of our population) suffered from diabetes. Disturbingly, roughly 90,000 (a third) of these cases were undiagnosed (MSDH, n.d.c). Since then, diabetes incidence has only risen.

Type 2 diabetes is typically considered a disease afflicting adults with poor eating habits and/or a genetic predisposition. However, recently the prevalence of type 2 diabetes has grown among children. Children who have family members with type 2 diabetes and who are of non-European ancestry are particularly at risk (ADA, 2000).

“Obesity is a hallmark of type 2 diabetes, with up to 85% of affected children either overweight or obese at diagnosis” (ADA, 2000, p. 382).
Increasing rates of obesity appear to be a major contributor to increasing rates of diabetes (CDC, 2008e). Because of the correlation between obesity and type 2 diabetes, increasing levels of obesity among children predict increasing levels of early-onset of type 2 diabetes. Early-onset type 2 diabetes is correlated with more severe “cardiovascular outcomes, rates of end-stage complications, and overall mortality,” and demographers predict “that recent childhood obesity trends will result in a shorter life expectancy for future generations because of diseases such as type 2 diabetes” (Lee, 2008, p. 685).

“Diabetes is associated with significant morbidity and premature mortality, and its complications are a major burden to individuals and to society” (ADA, 2000, p. 385).

In 1997, diabetes already cost Mississippians around $1.7 billion (Mississippi Chronic Illness Coalition, 2009). The rise of childhood obesity and resulting rise of early-onset diabetes signal severe fiscal difficulties for our state, as greater numbers of diabetics require treatment, more years of treatment are required in the case of early-onset diabetes, and productivity is lost. Weight loss and adoption of healthy living practices among our children can greatly reduce the severity of diabetes cases as well as reduce the risk of developing type 2 diabetes. Prevention, in the form of early testing for diabetes in obese children and in children with family histories of type 2 diabetes, followed by early health interventions, is also necessary (ADA, 2000).

“Health care investments or policy interventions to prevent or treat childhood obesity ...[can] have important effects on the overall health of the population, although improved health and related health economic outcomes may not be noted for several years” (Lee, 2008, p.685).

Health coverage for obesity prevention and treatment services; in-school interventions promoting increased physical activity and healthier eating habits; and in-school monitoring of BMIs to track effectiveness of prevention programs would represent positive first steps towards a healthier state and nation (Lee, 2008).

Diabetes incidence among children is still largely type 1, and the majority of youths suffering from diabetes were white between 1979 and 2004. However, disturbingly, diabetes death rates were higher for black youths over this period. Moreover, diabetes death rates were on the rise for black youths from 1994 to 2004 (while death rates for white youths were largely unchanged). These disparities may be attributable to problems in access to care (MMWR, 2007).
Investment in and proliferation of public child health insurance remains an important proactive approach to combating generational health disparities.

“There is growing evidence that many important adult diseases such as obesity, diabetes, hypertension, and cardiovascular disease are affected by events during gestation and early childhood. In addition, the development early in life of health-related behavior, such as eating preferences, exercise patterns, and tobacco use, may extend into adulthood and affect the risk for a variety of adult-onset diseases” (Wise, 2004, p. 21).

Preventive care for children could greatly affect the incidence of chronic diseases with roots in childhood. Child health and long-term preventive care depend on the availability of public health insurance for children. Public health insurance is available to children through Medicaid and the Children’s Health Insurance Program (or CHIP, a joint state-federal program designed to cover children from families with incomes too low to sustain child health insurance but too high to qualify for Medicaid). Expansion of public child health insurance programs simply requires more active recruitment of eligible children (Beal, 2004). While such expansions would cost more initially, investments in primary care for children, particularly with regards to prevention, should eventually result in savings, with reduced need for emergency care, chronic disease treatment, lost productivity, etc.

“...9 million children remain uninsured even though roughly two-thirds are eligible for Medicaid or CHIP” (Kaiser Family Foundation (KFF), 2009, p. 1).

The Children’s Health Insurance Program Reauthorization Act (CHIPRA) of 2009 expanded the child health insurance budget of Medicaid and CHIP by $33 billion over the subsequent 4.5 years. Medicaid currently covers 29 million children, while CHIP covers 7 million. The Congressional Budget Office estimates that 6.5 million additional children will receive coverage in 2013 as a result of CHIPRA. CHIPRA provides incentives to states for enrolling eligible children; allows states to officially cover pregnant women and legal aliens; and requires states to provide dental services (KFF, 2009).
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PREFACE
By Dr. Sanya Springfield
& Dr. Peter Ogunbiyi,
National Cancer Institute

CANCER
Overall Cancer Mortality

LUNG & OROPHARYNGEAL CANCER
Lung Cancer Mortality
Risk Factor: Smoking
Smoking Cessation Attempts
Oropharyngeal Cancer Mortality

PROSTATE CANCER
Prostate Cancer Mortality
Prostate Cancer Screening

BREAST & CERVICAL CANCER
Breast Cancer Mortality
Breast Cancer Screening
Cervical Cancer Mortality
Cervical Cancer Screening

COLORECTAL CANCER
Colorectal Cancer Mortality
Recommended Colorectal Cancer Screening
The 2009 Annual Report to the Nation on the Status of Cancer, 1975-2006, depicts a decline in overall rates of cancer incidence and rates of cancer mortality for most racial and ethnic populations in the United States. The overall decrease was driven largely by declines in incidence of and mortality from the three most common cancers in men (lung, prostate, and colorectal cancer) and two of the three leading cancers in women (breast and colorectal cancer). National Cancer Institute (NCI) Director Dr. John Niederhuber frames the nation’s condition best in The Nation’s Investment in Cancer Research: Connecting the Cancer Community, An Annual Plan and Budget Proposal for FY2009:

“We have made progress, but much work remains. The rate of cancer mortality continues to drop; however, cancer still remains a leading cause of death, second only to heart disease. The number of new cancer diagnoses continues to rise, with more than 1.4 million people hearing the dreaded words “you have cancer” (in 2007) in the United States alone. And we know this burden is disproportionately shouldered by the poor, the elderly, and minority populations” (U.S. Department of Health and Human Services (DHHS), 2009, p. 4).
Evidence suggests that disparities in cancer care are associated with high death rates among minorities. Minority women have lower rates of breast cancer than white women, but black women are more likely to die from the disease. Nationally, blacks have both higher incidence of and mortality from colorectal cancer than all other racial/ethnic groups. Black men are 50% more likely to have prostate cancer than whites and are more than twice as likely to die from it. Hispanic women are twice as likely to have cervical cancer as whites, while black women are twice as likely to die from the disease. Hispanics are more likely to suffer from infection-related cancers than non-Hispanics.

Of course, access to care alone does not completely account for these disparities. Because cancer initiation and progression are determined by complex interactions among genetic, behavioral, cultural, social, and environmental factors, some level of health disparity — e.g., higher than average incidence, more rapid disease progression, poorer outcome or survival — can affect anyone. However, several assessments conducted in recent years point to the unequal burden of disease in our society as not just a scientific and medical challenge but also a moral and ethical dilemma for our nation. Minorities and other underserved populations variously distinguished by race, ethnicity, gender, age, socioeconomic status, geographic location, occupation, and education bear a far greater cancer burden than the general population.

The NCI’s Center to Reduce Cancer Health Disparities (CRCHD) is at the forefront of the efforts to reduce cancer health disparities by employing the following strategies:

1. Understand the factors that cause cancer health disparities.
2. Work with communities to develop interventions targeted to the specific needs of underserved populations.
3. Provide the knowledge base for and develop interventions to enhance the integration of cancer services for underserved populations.
4. Work with others to develop a cadre of researchers and clinicians prepared to effectively address cancer health disparities.
5. Develop and work with others to implement innovative, educationally and culturally appropriate approaches for disseminating information on research results to underserved populations.

We cannot afford to ignore cancer health disparities for doing so will be at our own peril. According to the Census Bureau, U.S. minority populations will be the majority by 2042. By 2050, minorities collectively (those who identify as Hispanic, black, Asian, American Indian, Native Hawaiian, Pacific Islanders or mixed race) will account for 54% of the U.S. population which is projected to total 439 million that year.
Not only will the nation be more racially and ethnically diverse at midcentury, it also will be older, according to the Census Bureau. Meanwhile, the percentage of the population in the “working ages” of 18 to 64 is projected to fall from 63% to 57% between 2008 and 2050; over half of this crucial population will be minorities. Since ethnic diversity is recognized as one of the greatest assets held by the United States, it is in our own interest to diversify the workforce and address issues of health disparities and cancer health disparities.

This book, What if We Were Equal? A Mississippi Health Assessment, could not have come at a better time. We are of the opinion that it will be a tremendous asset to health care providers, policy makers, and students alike.

PREFACE REFERENCES


About the Contributing Editors

Sanya A. Springfield, Ph.D., is the Director of the Center to Reduce Cancer Health Disparities (CRCHD) at the National Cancer Institute (NCI). Dr. Springfield oversees CRCHD’s mission to coordinate and strengthen the NCI’s portfolio in basic, clinical, translational, and population-based cancer research to address cancer health disparities. Previously, Dr. Springfield was Chief of the current NCI Diversity Training Branch, a Program Director in the National Science Foundation’s Division of Integrative Biology and Neurosciences, and a faculty member at City College of the City University of New York. Dr. Springfield’s Ph.D. is in Physiology and Biophysics from Howard University in Washington, D.C., and she was awarded a National Research Service Award for postdoctoral studies in Pharmacology at the Robert Wood Johnson School of Medicine in Piscataway, N.J.

Peter O. Ogunbiyi, D.V.M., Ph.D., is a Program Director in the Diversity Training Branch of the Center to Reduce Cancer Health Disparities, National Cancer Institute. Dr. Ogunbiyi manages research supplements; co-manages the Minority Institution/Cancer Center Partnership program; and manages and administers the co-funding of the Minority Biomedical Research Support efforts. Prior to his appointment at the NCI, Dr. Ogunbiyi was in academia for over 20 years. He has held faculty positions at Ahmadu Bello University, Nigeria; Tuskegee University, Tuskegee, Alabama; Clayton College and State University; and Southern Polytechnic State University, Atlanta, Georgia. Dr. Ogunbiyi holds a Ph.D. and M.S. in Pharmacology/Toxicology from the University of Guelph, Ontario, Canada, and a D.V.M. and a B.S. in Biochemistry from Ahmadu Bello University, Nigeria. He completed his post-doctoral training in biochemical pharmacology and toxicology at the Department of Biomedical Sciences, Virginia Polytechnic and State University, Blacksburg, VA.
CANCER

OVERALL CANCER MORTALITY

Cancer is the second leading cause of death in the United States. Throughout the 1980s, cancer mortality increased, finally peaking for men in 1990 and for women in 1991. Since then, overall cancer incidence and mortality have declined steadily, a pattern typically attributed to improvements in methods of prevention and in methods of early detection and treatment (National Cancer Institute, 2007; Ward, Thun, Hannan, & Jemal, 2006). Similar to mortality trends, cancer diagnosis rates peaked and fell in the early 1990s. This correlation strongly emphasizes the role of prevention in the decline of mortality (Ward et al., 2006).

In 2007, cancer cost the United States $219 billion in direct medical expenses and loss of productivity due to illness and death costs. (American Cancer Society, 2008)

Source: CDC. Compressed Mortality Data, n.d.a
**Mississippi, the Nation, and Healthy People 2010**

Using the 1998 US rate of 202.4 deaths per 100,000 as a baseline, Healthy People calls for a decrease of overall cancer mortality to 159.9 per 100,000 by 2010 (U.S. Department of Health and Human Services (DHHS), n.d.). As of 2005, the nation had not reached this goal (the rate of overall cancer deaths at 186.9 per 100,000). However, if rates continue to follow the current downward trend, the overall US cancer rate will near the Healthy People goal by 2010.

**NOTE:** All rates and resulting measures are age-adjusted.

The lack of correlation between states with the highest levels of cancer mortality and states with the highest levels of cancer diagnosis indicates failures in tracking cancer incidence and/or disparities in access to care.
Since 1987, rates of overall cancer mortality in Mississippi exceeded national rates, and the disparity between Mississippi and the nation, for the most part, rose continuously. While cancer mortality in Mississippi began to decline very slightly at the same time as national rates began a major decline (in the early 1990s), Mississippi rates rose again in the late 90s and only began a sustained decline at the turn of this century. As a result, in 2005, overall cancer mortality in Mississippi (206.9 deaths per 100,000) was 20 deaths per 100,000 higher than the nation. Hence, Mississippi is unlikely to meet the Healthy People goal by 2010.

**Mississippians: How Have We Compared?**

Advantages Mississippians held over the rest of the country in cancer mortality in the late 1970s and early 80s have disappeared among all groups with the exception of white females.

In 1979, both black and white Mississippi females died at significantly lower rates (148.1 and 146.7 per 100,000 respectively) than white females across the United States (who died at a rate of 161.6 per 100,000).
However, this advantage has decreased consistently, and, in 1986, black female cancer mortality in Mississippi overtook national rates. Compared to 13.5 fewer deaths per 100,000 in 1979, black females in Mississippi in 2005 experienced 29.7 more deaths per 100,000 than their white US counterparts. Meanwhile, the advantage white females in Mississippi held over their US counterparts, 14.9 per 100,000 in 1979, diminished to a mere 0.4 per 100,000 by 2005.

Disturbingly, black and white females in Mississippi have not displayed the sustained downward trend in overall cancer mortality observed for all other groups.

Disparities are even greater amongst Mississippi males. Cancer mortality threatened white males in Mississippi at a rate almost equal to that of the nation in 1979. However, since 1981, rates for white MS males have floundered, and disparity between Mississippi and the United States has increased steadily. By 2005, white MS males died at a rate (248.3 per 100,000) that was 26 per 100,000 higher than the white US male rate (222.3 per 100,000).
Meanwhile, overall cancer mortality rates for black MS males have always exceeded the rates for white US males, with the disparity between these groups growing larger and larger over time. In 1979, black males in Mississippi died of cancer at a rate (275 per 100,000) that was 13.8 per 100,000 worse than the national white rate. By 2005, the black MS male rate had rocketed (to 337 per 100,000) while the white US male rate had fallen (to 222.3 per 100,000). 114.7 per 100,000 more black males in Mississippi would have survived in 2005 if we achieved at white national levels.

<table>
<thead>
<tr>
<th>Cancer Mortality (per 100,000)</th>
<th>1979</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white female</td>
<td>161.6</td>
<td>155.2</td>
</tr>
<tr>
<td>MS white female</td>
<td>146.7</td>
<td>154.8</td>
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<tr>
<td>MS black female</td>
<td>148.1</td>
<td>184.9</td>
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<tr>
<td>US white male</td>
<td>261.2</td>
<td>222.3</td>
</tr>
<tr>
<td>MS white male</td>
<td>255.2</td>
<td>248.3</td>
</tr>
<tr>
<td>MS black male</td>
<td>275.0</td>
<td>337.0</td>
</tr>
</tbody>
</table>

Because we were not equal...

- 169 more black females in Mississippi
- 229 more white males in Mississippi
- 582 more black males in Mississippi
...died of cancer in 2005.

**NOTE:** In tables, red data represent a worsening in rate or percentage over the observed time period. Green data represent an improvement in rate or percentage.

**NOTE:** Measurements of equality employ national white data as the standard for comparison.

Almost **1 in 3** cancer deaths among black Mississippi males would have been averted in 2005 if we had achieved at white national levels.

Nearly **1 in 10** deaths among white males could have been averted.
Cancer registries allow states to monitor cancer incidence and mortality as well as stage of identification and progression of diseases. In 1993, the state of Mississippi set aside funding for a state-wide cancer registry. Through this registry, disparities can be identified and programs developed to address differences in cancer incidence, identification, and mortality. (The Partnership for a Healthy Mississippi, n.d.)
FORREST GENERAL HOSPITAL

Forrest General Hospital, located in Hattiesburg, MS, serves a 17-county area in South Mississippi. Since opening in 1952, Forrest General has grown tremendously, from a 90-bed facility to a facility that includes 512 in-patient beds and a level II trauma center. Forrest General Hospital operates the only Comprehensive Community Cancer Center in the 17-county service area. The Center provides detection, diagnosis, education, prevention, screening, rehabilitative, and treatment services. (Images provided by Byron Malone, 2010.)

LUNG & OROPHARYNGEAL CANCER

LUNG CANCER MORTALITY

Lung cancer is the leading cause of cancer mortality in the United States. Lung cancer mortality rose across the United States throughout the 1980s, but rates have gradually declined since 1993. This decline is typically attributed to reducing smoking rates over the last 30 years. Unfortunately, only 16% of lung cancer cases are diagnosed early, when the cancer is still localized and thus more successfully treated. Early detection strategies such as chest x-rays, sputum cell analyses, and fiber-optic examination of bronchial passages, have not been shown effective in preventing mortality (American Cancer Society, 2008).
Mississippi, the Nation, and Healthy People 2010

Using the 1998 US baseline of 57.6 deaths per 100,000, Healthy People calls for a drop in lung cancer mortality to 44.9 per 100,000 by 2010 (DHHS, n.d.). By 2005, lung cancer deaths had only declined to 53.7 per 100,000; at this rate, the nation is unlikely to meet the Healthy People target by 2010.

In 1979, only 0.7 more lung cancer deaths per 100,000 occurred in Mississippi in comparison to the nation. However, lung cancer mortality in Mississippi quickly rose above US rates, and the disparity between Mississippi and the US has increased steadily. Mississippi lung cancer mortality rates did not begin a steady decline until after a peak (of 71.3 deaths per 100,000) in 2000—seven years later than national rates began to decline. In 2005, Mississippians died from lung cancer at a rate (64.3 per 100,000) that was 10.6 per 100,000 higher than the national rate. Hence, Mississippi is even less likely than the nation to attain the Healthy People target by 2010.

New early screening strategies, such as low-dose spiral computed tomography scans and tests for certain molecular markers in sputum, may increase effectiveness in identifying lung cancer at initial, operable stages

(American Cancer Society, 2008).
**Mississippians: How Have We Compared?**

After a minor increase in the 1980s, lung cancer mortality rates for white US males have declined consistently (from 81.6 deaths per 100,000 in 1979 to 68.7 per 100,000 in 2005). In comparison, white males in Mississippi have experienced consistently higher lung cancer mortality and have also seen multiple increases in mortality between 1979 and 2005. As a result, the overall decline in mortality from 1979 to 2005 for white MS males was minor (from 96.9 to 90.8 per 100,000). If white MS males achieved at national rates, 22.1 fewer white males per 100,000 would have died of lung cancer in 2005.

Unlike white MS males, in 1979 black MS males died less frequently (at a rate of 72.7 per 100,000) from lung cancer compared to their national counterparts. This advantage of 8.9 fewer deaths per 100,000 was lost the following year, when the black MS rate overtook national lung cancer mortality, and the rate has continued to increase rapidly. If black MS males (with a rate of 104.4 per 100,000) had achieved at the national white rate in 2005, 35.7 per 100,000 more black males would have survived lung cancer.

Interestingly, when diagnosed with lung cancer in early stages, African American men are not as likely to receive surgery, the most effective treatment. This disparity, which disappears under the

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Source: CDC, Compressed Mortality Data, n.d.a; n.d.b

Roughly **1 in 3** lung cancer deaths among black Mississippi males would have been averted in 2005 if we had achieved at white national levels. Among white Mississippi males, **1 in 4** deaths would have been averted.
Continued higher incidence and death rates among some racial and ethnic groups may be an indication that some populations have not benefited equally from cancer prevention and control efforts. Such disparities may be due to multiple factors, such as late stage of disease at diagnosis, barriers to health care access, a history of other diseases, biologic and genetic differences in tumors, health behaviors, and the presence of risk factors. A commitment to reducing morbidity and mortality from cancer in the United States will require concomitant dedication to bridging racial and ethnic disparities related to cancer incidence and mortality”

(Wingo et al., 1999, p. 683).
LUNG CANCER RISK FACTOR: SMOKING

Mississippi, the Nation, and Healthy People 2010

From 2000 to 2007, the nation saw a steady decrease (from 22.3% to 19.5%) in the number of current smokers (persons who have smoked at least 5 packs in their entire life and currently smoke every day or some days). However, this rate of decrease is not nearly sufficient to meet the Healthy People goal of 12% by 2010. With rates of smoking even higher than the nation, Mississippi will also fail to meet the Healthy People goal in 2010. Moreover, Mississippi has not experienced an overall decrease in smoking (from 23.6% in 2000, rates rose to 27.6% in 2002, returning to 24.1% by 2007). In 2007, 4.6% more people smoked in Mississippi, compared to the nation.

Lung cancer is the leading cause of cancer mortality and the third leader in incidence. Because of the import of lung cancer, “the largest impact [on overall cancer incidence and death rates] can be made through programs and policies that deter smoking initiation, promote cessation, and protect nonsmokers from environmental tobacco smoke” (Wingo et al., 1999, p. 687).
Mississippians: How Have We Compared?

Unlike for white US males, among whom smoking decreased from 2000 to 2007 (from 24.2 to 20.7%), rates for white MS males increased slightly (from 25.3 to 26.1%). These disparate trends created a widening disparity between MS and US white males that reached 5.4% in 2007. Meanwhile, rates for black MS males, initially very close to white MS males, have increased much more sharply (from 25.5% in 2000 to 30.4% in 2007), creating a 9.7% disparity between black MS males and white US males in 2007. Disturbingly, black MS males actually showed downward trends that approached white US rates in the early and middle parts of the decade, before rates spiked upwards once more.

Similar to US male patterns but at lower magnitudes, white US females show a slight decrease in smoking from 2000 to 2007, from 22% to 18.8%. However, white MS females, unlike their male MS counterparts, also show a decrease in rates, from 24.5 to 22.8%. In an even greater departure, black MS females actually consistently smoke at lower rates than their white US counterparts. However, as white US females slowly decrease in smoking, black MS females are slowly increasing, from 12.8% to 15.6% between 2000 and 2007. As a result, while currently performing better than any other group, black MS female rates are actually worsening.
SMOKING CESSATION ATTEMPTS

Mississippi, the Nation, and Healthy People 2010

Smoking cessation attempts (or the number of smokers who attempted to quit smoking and stopped for one day or longer in the previous year) have improved for the US (increasing from 50.4% to 57.7% between 2000 and 2007). However, this rate of improvement is not sufficient to meet the Healthy People goal of 75% by 2010. Mississippi has seen a slightly more rapid increase in smoking cessation attempts than the US (from 46.6% to 56.7%). Overall, the disparity between the US and Mississippi decreased from 3.9% in 2000 to 1% in 2007; moreover, smoking cessation attempts by Mississippians actually exceeded national attempts for the majority of the observed period. Unfortunately, like the US, Mississippi is unlikely to meet the Healthy People goal by 2010.

In the effort against tobacco use, The Partnership for a Healthy Mississippi provides information resources, school- and community-based programs, and policy support; and collaborates with public health organizations across Mississippi.

“Through a science-based approach, The Partnership for a Healthy Mississippi is leading the fight to ensure our youth are able to avoid the dangers of tobacco use, while also helping current tobacco users kick their addiction. The programs of The Partnership help save the lives of thousands of Mississippians and help save the taxpayers of Mississippi millions of dollars”

(The Partnership for a Healthy Mississippi, 2009, p. 1).
Mississippians: How Have We Compared?

Rates of smoking cessation attempts for Mississippi whites and US whites track fairly close together over the 2000 to 2007 period. Rates for white MS males rose slightly overall (from 45.8% to 50.3% in 2007) but fluctuated without showing any significant upward or downward trend for the majority of the period; white US males saw similar patterns (with a rate of 48.1% in 2000 and a rate of 52.6% in 2007).

Rates for white females in Mississippi and across the nation fluctuated similarly, rising overall but with little true trend in recent years. (Rates for white MS females saw an overall rise from 44.1% in 2000 to 51.9% in 2007, while rates for white US females rose from 47.9% in 2000 to 56.1% in 2007.)

Meanwhile, rates of smoking cessation attempts for black Mississippians were much higher than white national rates. Rates for black males remained fairly stable (from 62.3% in 2001 to 65.8% in 2007), and rates for black females increased sharply (from 50.3 in 2001 to 66.6% in 2007).

<table>
<thead>
<tr>
<th>Attempted smoking cessation</th>
<th>2000</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>48.1%</td>
<td>52.6%</td>
</tr>
<tr>
<td>MS white male</td>
<td>45.8%</td>
<td>50.3%</td>
</tr>
<tr>
<td>MS black male</td>
<td>62.3%</td>
<td>65.8%</td>
</tr>
<tr>
<td>US white female</td>
<td>47.9%</td>
<td>56.1%</td>
</tr>
<tr>
<td>MS white female</td>
<td>44.1%</td>
<td>51.9%</td>
</tr>
<tr>
<td>MS black female</td>
<td>50.3%</td>
<td>66.6%</td>
</tr>
</tbody>
</table>

Because we were not equal...

2.3% fewer white males in Mississippi

4.2% fewer white females in Mississippi

...attempted to quit smoking in 2007.
Oropharyngeal cancer mortality occurs at much lower rates than lung cancer mortality. However, oropharyngeal cancer typically goes undiagnosed until it has spread, creating a five-year survival rate of 50%, similar to that of late-diagnosed lung cancer (American Cancer Society, 2008).

Mississippi, the Nation, and Healthy People 2010
Similar to lung cancer patterns, Mississippians suffer oropharyngeal cancer mortality at higher rates than the US, and this disparity is increasing. Using the 1998 US rate of 3 per 100,000 deaths as a baseline, Healthy People calls for a drop to 2.7 oropharyngeal cancer deaths per 100,000 by 2010. By 2005, the US had met and bettered the Healthy People 2010 goal (with 2.5 oropharyngeal cancer deaths per 100,000). Mississippi rates, however, have fluctuated around 3.6 per 100,000 since 1998, and Mississippi is therefore unlikely to achieve the Healthy People 2010 goal. If Mississippian had achieved the national rate in 2005, 1.4 per 100,000 more Mississippian would have survived.

<table>
<thead>
<tr>
<th>Oropharyngeal Cancer Mortality (per 100,000)</th>
<th>1979</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>6.2</td>
<td>3.6</td>
</tr>
<tr>
<td>MS white male</td>
<td>6.4</td>
<td>4.8</td>
</tr>
<tr>
<td>MS black male</td>
<td>---</td>
<td>11.1</td>
</tr>
</tbody>
</table>
Mississippians: How Have We Compared?

In Mississippi, oropharyngeal cancer mortality measures are largely unreliable for females. Males in Mississippi, on the other hand, clearly die at rates higher than the nation. While oropharyngeal cancer mortality declined steadily among white US males (from 6.2 per 100,000 in 1979 to 3.6 per 100,000 in 2005), mortality among white MS males fell more slowly (from 6.4 to 4.8 per 100,00). The slower decrease in mortality among white MS males created an increasing disparity from national rates, with 0.2 excess deaths per 100,000 among white MS males becoming 1.2 per 100,00.

Rates of oropharyngeal cancer mortality were much greater among black Mississippi males and showed no overall decline over the observed period. As a result, disparity between black MS males and their white national counterparts grew rapidly. By 2005, the rate of oropharyngeal cancer mortality among black MS males (at 11.1 per 100,000) was more than 3 times higher than the national rate. 7.5 more black MS males died per 100,000 in 2005 because we did not achieve like the nation.

Roughly 1 in 4 oropharyngeal cancer deaths among white Mississippi males would have been averted in 2005 if we had achieved at white national levels.

Among black Mississippi males, 2 in 3 oropharyngeal cancer deaths would have been averted.

Because we were not equal...

11 more white males in Mississippi
38 more black males in Mississippi
...died of oropharyngeal cancer in 2005.
CANCER

PROSTATE CANCER

PROSTATE CANCER MORTALITY

Mississippi, the Nation, and Healthy People 2010

Prostate Cancer is the second leading cause of cancer mortality amongst American men. Using the 1998 US rate of 32 deaths per 100,000 as a baseline, Healthy People calls for a reduction in prostate cancer mortality to 28.8 per 100,000 by 2010. By 2005, the national rate of prostate cancer mortality (25 per 100,000) had met and bettered the 2010 target. In contrast, Mississippians, who died from prostate cancer at a much higher rate, had not yet reached the Healthy People target. In 2005, 6.9 per 100,000 more Mississippians died of prostate cancer compared to the nation. Nevertheless, the drop in Mississippi rates between 1998 and 2005 (46.3 per 100,000 to 31.9 per 100,000) is sufficiently steep so that, if Mississippi rates continue to fall in this pattern, Mississippi will achieve the Healthy People goal by 2010.

The disparity in prostate cancer mortality between black Mississippians and whites across the nation nearly doubled between 1979 and 2005.

If Mississippi had achieved like the nation in 2005, more than 1 of every 5 prostate cancer deaths in Mississippi would have been averted.

Source: CDC, Compressed Mortality Data, n.d.a; n.d.b
Mississippians: How Have We Compared?

Prostate cancer mortality among white males across the nation rose until 1991 (30.1 deaths per 100,000 in 1979 rising to a peak of 36.1 per 100,000); since then, rates have dropped (to 22.6 per 100,000 as of 2005). White males in Mississippi initially performed better than their national counterparts (with a rate of 24.8 per 100,000 in 1979). However, the gap between whites in Mississippi versus the nation has decreased, and periodically disappeared, over time. As of 2005, the rate of prostate cancer mortality among whites in Mississippi (21.7 per 100,000) only trailed the nation by 0.9 per 100,000.

While whites in Mississippi experienced similar or better rates than US whites, black males in Mississippi died at much higher rates, this disparity growing over time. In 1979 (with a rate of 53.4 per 100,000), 23.3 per 100,000 more black males in Mississippi died of prostate cancer because we did not achieve like whites across the nation. Rates among black MS males peaked later than US rates (at 89.8 per 100,000 in 1994), and the earliest signs of a sustained decline did not appear until 2003, widening the disparity between black MS males and whites across the nation. By 2005, the number of excess deaths among black males in Mississippi (with a rate of 63.4 per 100,000) had almost doubled to 40.8 excess per 100,000.
PROSTATE CANCER SCREENING

While Healthy People 2010 does not set forth targets for prostate cancer screenings, regular Prostate Specific Antigen (PSA) tests and Digital Rectal Exams (DRE) have proven successful in early detection of prostate cancer. According to the National Cancer Institute, while recommendations for PSA and DRE screenings vary, doctors typically advise annual examinations for men over the age of 50 (American Cancer Society, 2008).

Mississippians: How Have We Compared?
Whites across the nation have seen a slight decline in PSA screenings (measured as men over the age of 50 having received screening within the previous two years) over the 2001 to 2007 period (dropping from 70% to 68.2%). In contrast to national rates, males in Mississippi have pursued PSA screening at slightly increasing rates. The rise in screening among white males in Mississippi (from 66.2% in 2001 to 67.9% in 2006) placing white Mississippians less than a percentage point behind whites across the nation as of 2006.

Black males in Mississippi saw an even sharper increase (from 49.5% in 2001 to 60.9% in 2006). However, despite rising rates, black MS males remained far behind their white national counterparts – 7.3% fewer received screening as of 2006.

<table>
<thead>
<tr>
<th>Recently received a PSA test</th>
<th>2001</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>70.0%</td>
<td>68.2%</td>
</tr>
<tr>
<td>MS white male</td>
<td>66.2%</td>
<td>67.9%</td>
</tr>
<tr>
<td>MS black male</td>
<td>49.5%</td>
<td>60.9%</td>
</tr>
</tbody>
</table>

Because we were not equal...
- 0.3% fewer white males in Mississippi
- 7.3% fewer black males in Mississippi
...received regular PSA testing in 2006.
In contrast to PSA screening trends, DRE screening has fallen not just among white US males (from 65.4% to 61.8% between 2001 and 2007) but also among white MS males. A slightly more rapid decline among white MS males (from 61.1% to 56.5% between 2001 and 2006) left whites in Mississippi trailing the US by 5.3% as of 2006. While rates of DRE screening among black MS males remained fairly stable (49.7% in 2001 to 49.9% in 2006), a huge disparity between MS blacks and US whites persists. In 2006, black MS males trailed their white national counterparts by 11.9%.

The five-year survival rate for prostate cancer is almost 100% for whites, but only 95% for blacks. Similarly, prostate cancer is diagnosed in early stages for 92% of whites but only 89% of blacks (American Cancer Society, 2009). Increased screening for blacks could significantly reduce mortality disparities.
BREAST & CERVICAL CANCER

BREAST CANCER MORTALITY

Mississippi, the Nation, and Healthy People 2010

Breast cancer is the second leading cause of cancer mortality amongst US women, as well as the second most commonly diagnosed cancer overall (American Cancer Society, 2008). Using the 1998 US rate of 27.9 breast cancer deaths per 100,000 as a baseline, Healthy People calls for a reduction in female breast cancer mortality to 22.3 deaths per 100,000 by 2010. Since this time, breast cancer mortality has declined steadily for females across the nation (dropping to 24.6 deaths per 100,000 by 2005); if the current rate of decline continues, US females should meet the Healthy People goal by 2010. Unlike the nation, Mississippi has seen little change in breast cancer mortality rates in recent years (at 26.2 per 100,000 in 1998 and 26 per 100,000 in 2005). Mississippi is thus unlikely to reach the Healthy People 2010 goal. If Mississippians achieved at US levels, 1.4 more Mississippians per 100,000 would have survived in 2005.

More than 1 of every 3 breast cancer deaths among black Mississippians would have been averted in 2005 if we had achieved the national white rate.

<table>
<thead>
<tr>
<th>Breast Cancer Mortality (per 100,000)</th>
<th>1979</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white female</td>
<td>31.5</td>
<td>23.4</td>
</tr>
<tr>
<td>MS white female</td>
<td>26.7</td>
<td>21.0</td>
</tr>
<tr>
<td>MS black female</td>
<td>18.8</td>
<td>36.6</td>
</tr>
</tbody>
</table>

Source: CDC, Compressed Mortality Data, n.d.a, n.d.b
Mississippians: How Have We Compared?

Since 1979, national rates of breast cancer mortality for white females have declined steadily (from 31.5 per 100,000 to 23.4 per 100,000 in 2005). Initially, both black and white Mississippians died of breast cancer at lower rates than US whites. Moreover, the black MS female rate (18.8 per 100,000) in 1979 was lower than even the white MS female rate (26.7 per 100,000). Since then, however, while white MS breast cancer mortality also declined, black MS mortality rose.

Compared to national rates, breast cancer mortality among white Mississippian has only declined slightly over the 1979 to 2005 period (from 26.7 per 100,000 to 21 per 100,000). While these rates remain below national rates, the advantage white Mississippian held over their national counterparts has dropped by half, from 4.8 per 100,000 in 1979 to only 2.4 per 100,000 fewer deaths in 2005.

Unlike their state and national white counterparts, black females in Mississippi have not seen a sustained decline in breast cancer mortality.
Meanwhile, breast cancer mortality among black Mississippians surpassed white US rates in the late 1980s and has shown no sustained decline over the observed period (reaching a rate of 36.6 deaths per 100,000 by 2005). If black Mississippians had achieved the national white rate in 2005, 13.2 per 100,000 more would have survived.

The reduced likelihood of breast cancer diagnosis among African Americans during the early, local, and thus more treatable stage surely contributes to disparities in mortality. Black women experience a 77% breast cancer survival rate over 5 years compared to a 90% rate among white women (American Cancer Society, 2009).

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<table>
<thead>
<tr>
<th>Because we were not equal...</th>
</tr>
</thead>
<tbody>
<tr>
<td>75 more black females in Mississippi</td>
</tr>
<tr>
<td>...died of breast cancer in 2005.</td>
</tr>
</tbody>
</table>
```

“Disparities in [breast cancer] survival are partially a function of diagnosis at a more advanced stage, possibly related to limited information available about breast cancer risk factors, limited opportunities for screening, or cultural beliefs about risks and mortality. Other factors, including disparate effects of therapy, may also play a role in mortality rates as minority women display worse stage-specific survival. Disparities may also emerge from interactions between genetic predisposition and various risk factors such as the effect of culturally related behaviors such as dietary and exercise patterns in certain individuals. There are also links between race/ethnicity and indicators of disadvantage, such as low income, low educational level, and lack of health insurance that are themselves independently associated with advanced stage diagnosis and diminished survival. To magnify the deleterious effect of social and economic risk factors, current treatments for palpable breast masses and diagnosed stages I and II cancers are reportedly used less frequently by disadvantaged and minority patients”

BREAST CANCER SCREENING

An often cited explanation for declining rates of breast cancer mortality is the increase in screening measures, particularly mammograms and physical breast examinations. Consistent examinations allow for early detection and treatment of breast cancer (National Cancer Institute, 2007).

**Mississippi, the Nation, and Healthy People 2010**

Using the 1998 US rate of 67% as a baseline, Healthy People calls for 70% of women aged 40 and older to have received a recent mammogram (within the preceding 2 years) by 2010. According to the Behavioral Risk Factor Surveillance Survey (BRFSS) in 2000, women across the US met and exceeded the Healthy People target (with 74.1% receiving mammograms at appropriate intervals). However, that rate declined in the first part of the decade (dipping down to 71.5% in 2004) before rising back in 2007 (to 73.5%). While the 2007 US mammogram rate achieves the Healthy People 2010 goal, it represents a decline in screening from previous years.

From 2000 to 2007, the rates of Mississippians receiving regular mammograms fluctuated (reaching a high of 67.1% in 2001 and a low of 63.3% in 2004) but, overall, remained unchanged (from 65.5% in 2000 to 65.4% in 2006). In 2006, Mississippians trailed the nation by 8.3% in regular mammogram screening, and given recent trends, Mississippi is unlikely to achieve the Healthy People goal by 2010.

**NOTE:** Healthy People 2010 uses the National Health Interview Survey (health care provider-reported data) to set the baseline and track progress for mammograms, while the data herein derives from BRFSS (self-reported data).
Mississippians: How Have We Compared?

White US females saw fairly stable rates of mammogram screening from 2000 to 2007 (a rate of 74.6% in 2000 dropping to a low of 71.8% in 2005 but then rising back to 74.5% by 2007). Meanwhile, despite bettering their national counterparts in breast cancer mortality, white MS females saw lower rates of mammogram screening. Between 2000 and 2006, rates of mammogram screening for white MS females dropped (dipping from 67.4% in 2000 to 63.9% in 2005) before rising back (to 66.3%) in 2006, mirroring patterns observed for their national counterparts but at levels trailing below the nation by 7% to 8%.

As discussed previously, the advantage white MS females hold over their national counterparts in breast cancer mortality is narrowing sharply over time. The lower levels of mammogram screening among white MS females may predict an impending jump in breast cancer mortality that eliminates this advantage entirely.

Black females in Mississippi experience the lowest rates of mammogram screening. This bodes poorly for the group’s rates of breast cancer mortality, which are already rising rapidly, reaching more than 1.5 times the white national rate in 2005. Rates of mammogram screening among black MS females fluctuated between 2000 and 2006 (beginning at 61.7% and settling at 63.1%), when black females in Mississippi trailed their white national counterparts by 11.5%.

Mammograms can detect breast cancer earlier, allowing earlier treatment, which in turn produces higher survival rates (American Cancer Society, 2008).

### Recently received a mammogram (age 40 and over)

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white female</td>
<td>74.6%</td>
<td>74.6%</td>
</tr>
<tr>
<td>MS white female</td>
<td>67.4%</td>
<td>66.3%</td>
</tr>
<tr>
<td>MS black female</td>
<td>61.7%</td>
<td>63.1%</td>
</tr>
</tbody>
</table>

Because we were not equal...

- 8.3% fewer white females in Mississippi
- 11.5% fewer black females in Mississippi
- ...received regular mammograms in 2006.
While Healthy People 2010 does not set a target for clinical breast examinations, breast examinations remain a routine form of cancer screening (National Cancer Institute, 2009). Clinical breast exam screening rates (number of women aged 40 and older who have had an exam within the last two years) have held fairly steady for white females in the US (fluctuating since 2000 around a rate of 77% with a high of 78.3% in 2001 and a low of 76.3% in 2003). Rates for black females in Mississippi also held fairly steady but fell far short of white US female rates (with black MS rates fluctuating around a 2000 rate of 68.5%). In 2006, clinical breast exam screening for black Mississippian (67.9%) lagged behind the white national rate by 9.0%.

Meanwhile, clinical breast exam rates for white females in Mississippi have declined steadily (from 72.6% in 2000 to 66.6% in 2006). Where white Mississippian initially bettered their black counterparts, they now lag behind, and the disparity between white Mississippi rates and white national rates has increased greatly, 10.3% fewer white Mississippian receiving clinical breast exam screening in 2006.

Interestingly, small declines in breast cancer mortality observed in all groups from 2000 to 2006 do not coincide with an increase in mammogram or clinical breast exam screening rates. An increase in screening prior to the period covered by available screening data, which only begins in 2000, is one possible explanation for recent declines in mortality.

In this same vein, the decrease in mammogram and clinical breast exam screening for white Mississippi women is not correlated with an increase in mortality for this group but may predict a coming rise. Slight decreases in incidence of breast cancer due to reduced use of Hormone Replacement Therapy could also account for these seeming inconsistencies (American Cancer Society, 2008).
CERVICAL CANCER MORTALITY

Mississippi, the Nation, and Healthy People 2010

Since 1979, cervical cancer mortality rates have declined steadily. Using the 1998 US rate of 3.0 deaths per 100,000 as a baseline, Healthy People calls for a reduction in cervical cancer mortality to 2 deaths per 100,000 by 2010. In 2005, females across the US had made encouraging progress toward the Healthy People goal (achieving a rate of 2.5 per 100,000). In contrast, Mississippi has not seen a significant decline in cervical cancer rate mortality in recent years (fluctuating around the 1998 rate of 3.7 per 100,000, reaching a high of 4.7 in 1999 and a low of 2.7 in 2001). In 2005, Mississippi (with a rate of 3.5 per 100,000) trailed the nation by 1 death per 100,000. With no significant decline in rates since 1998, Mississippi seems unlikely to meet the Healthy People 2010 goal.

More than 1 in 3 cervical cancer deaths among black Mississippians would have been averted in 2005 if we had achieved at white national levels.

<table>
<thead>
<tr>
<th>Cervical Cancer Mortality (per 100,000)</th>
<th>1979</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white female</td>
<td>3.9</td>
<td>2.2</td>
</tr>
<tr>
<td>MS white female</td>
<td>3.1</td>
<td>2.4</td>
</tr>
<tr>
<td>MS black female</td>
<td>11.1</td>
<td>5.9</td>
</tr>
</tbody>
</table>

Source: CDC, Compressed Mortality Data, n.d.a; n.d.b
Rates of cervical cancer mortality for whites across the US declined from 1979 to 2005 (from 3.9 per 100,000 to 2.2 per 100,000). Cervical cancer mortality among white Mississippian tracked closely with rates among their national counterparts (a rate of 3.1 per 100,000 in 1979 dropping to 2.4 per 100,000 in 2005). In 2005, cervical cancer deaths among white Mississippians only exceeded the US white rate by 0.2 per 100,000.

Black Mississippian, however, died of cervical cancer at consistently higher levels (a rate of 11.1 per 100,000 in 1979 dropping to 5.9 per 100,000 in 2005) than whites at the state and national levels. While the disparity between black Mississippian and their white counterparts has decreased over time, from 7.2 excess cervical cancer deaths per 100,000 in 1979 to 3.7 per 100,000 in 2005, the rate among black MS females in 2005 was still more than two and half times greater than white US rate.
CERVICAL CANCER SCREENING

Cervical cancer is highly treatable if caught in early stages. Annual Papanicolaou (Pap) tests very effectively identify cervical cancer in these early, treatable stages (American Cancer Society, 2008).

**Mississippi, the Nation, and Healthy People 2010**

Using the 1998 US rate of 92% of women having ever received a Pap test and 79% having received a Pap test recently, Healthy People sets two goals for women in 2010: 97% of all women 18+ should have received a Pap test at least once and 90% of women 18+ should have received a Pap test recently (in the preceding 3 years).

From 2000 to 2007, rates for US women ever having received Pap test remained fairly stable, fluctuating slightly (from a high of 94.8% in 2003 to a low of 93.6% in 2006 before rising back to 94.4% in 2007). **Given this trend, the US is unlikely to meet the Healthy People goal by 2010.** In Mississippi, rates of screening are also fairly static overall, though fluctuating more severely (starting from 95% in 2000 and peaking in 2001 and 2005 at 96.4 and 96.3%, respectively, before settling back to 95.5% in 2006). **While unlikely to meet the Healthy People 2010 goal for ever receiving a Pap test, Mississippians consistently outperform the US.** In 2006, 1.9% more Mississippian had received a Pap screening at least once in comparison to US women.

**NOTE:** Healthy People 2010 uses the National Health Interview Survey (health care provider-reported data) to set the baseline and track progress for Pap screening, while the data herein derives from BRFSS (self-reported data).
The relationship between Mississippi and the US reverses with regards to recent Pap screening, with US females receiving higher levels of recent screening compared to MS females. Moreover, while numbers of women ever receiving Pap screening is relatively static over the 2000 to 2007 period, rates of women having received recent Pap screening declined (rates in the US dropping from 82.5% to 80.2% and rates for Mississippian dropping from 81.7% in 2000 to 78.3% in 2006). Neither the US nor Mississippi, which trailed the US by 1.0% in 2006, is approaching the Healthy People 2010 goal for recent Pap testing — in fact, we are moving further and further away.

Mississippians: How Have We Compared?

Over the 2000 to 2007 period, rates of women ever having received a Pap smear remained fairly static overall. Rates for white women in Mississippi (95.7% screened in 2000 and 96.2% in 2006) generally exceeded rates for white women across the nation (95.4% in 2000 and 95.7% in 2007), with white US women trailing white MS women by 1.2% in 2006.

Black females, however, typically attained screening at slightly lower rates (with 94.4% screened in 2000 and 94.5% screened in 2006) than their white national counterparts; 0.5% fewer black females in Mississippi had ever received Pap screening in comparison to US whites in 2006. Lower rates of ever having received a pap test among black females may explain their high rates of cervical cancer mortality.
Interestingly, the relationship between black and white MS females is reversed when considering recent Pap testing. Moreover, the disparities between US whites, MS whites, and MS blacks are much larger in magnitude.

For all groups, from 2000 to 2007, the number of women having received a recent Pap test dropped. The sharpest drop occurred among white females, with rates for white MS females falling more rapidly (from 79.8% in 2000 to 75.5% in 2006) than rates among white US females (from 82.4% to 78.9%), leading to an increasing disparity. In 2006, white Mississippi females were 3.4% less likely to receive regular Pap screening compared their national counterparts.

Meanwhile, black females in Mississippi actually saw higher rates of recent Pap screening compared to their white national counterparts. The drop in recent Pap testing among black females in Mississippi was also less severe (from 85.6% in 2000 to 83.5% in 2006), resulting in an increase in the advantage experienced by black MS females. In 2006, 4.6% more black MS females recently received a Pap test compared to US whites.

Higher rates of recent pap screening for black females in Mississippi from 2000 to 2006, could lead to a future reduction in disparity between black Mississipians and their white national counterparts with regards to cervical cancer mortality. Meanwhile, lower rates of recent pap screening among white Mississipians could predict an increase in cervical cancer mortality in this group.

Lower likelihood among black females in Mississippi of having ever received a Pap test may explain the currently dismal cervical cancer mortality rates plaguing this population. Higher rates of recent Pap screening among black Mississipians may predict improvements in cervical cancer mortality rates.

<table>
<thead>
<tr>
<th>Recently received a Pap test</th>
<th>2000</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white female</td>
<td>82.4%</td>
<td>78.9%</td>
</tr>
<tr>
<td>MS white female</td>
<td>79.8%</td>
<td>75.5%</td>
</tr>
<tr>
<td>MS black female</td>
<td>85.6%</td>
<td>83.5%</td>
</tr>
</tbody>
</table>

Because we were not equal...

3.4% fewer white females in Mississippi...received regular pap tests in 2006.
Colorectal cancer is the third leading cause of cancer mortality in the United States. Using the 1998 US rate of 21.2 deaths per 100,000, Healthy People calls for a reduction in colorectal cancer mortality to 13.9 per 100,000 by 2010. National rates for colorectal cancer mortality have declined consistently (reaching 17.7 per 100,000 by 2005). If current trends continue, the US could easily meet the Healthy People goal. In Mississippi, however, rates have remained fairly static through the 1979 to 2005 period. Thus, while Mississippi once held an advantage over the nation, the 2005 Mississippi rate of colorectal cancer mortality (19.9 per 100,000) exceeded national rates by 2.2 per 100,000. While rates have begun to decline slightly in recent years, the overall static nature of colorectal cancer mortality rates in Mississippi makes achievement of the Healthy People target unlikely.
Mississippians: How Have We Compared?

In 1979, black males in Mississippi (with a rate of 21 colorectal cancer deaths per 100,000) held an 11.6 per 100,000 advantage over white males across the nation, while white males in Mississippi (with a rate of 25.6 deaths per 100,000) held a 7 per 100,000 advantage. However, over the 1979 to 2005 period, while rates of colorectal cancer mortality declined for white US males, rates for white males in Mississippi remained static and rates for black MS males rose. As a result, by 2005 both white and black Mississippians suffered higher rates of colorectal cancer mortality than their white national counterparts. White Mississippians (with a rate of in 21.8 per 100,000) only exceeded their national counterparts by 1.4 per 100,000 in 2005. In contrast, black males in Mississippi (with a rate of 28.9 per 100,000 in 2005) died of colorectal cancer at a rate 8.5 per 100,000 higher than that of their white national counterparts.

The pattern of colorectal cancer mortality among female Mississippians is very similar to the male experience, but at lower rates. In 1979, black MS females (with a rate of 19.3 colorectal cancer deaths per 100,000) held an advantage of 4.5 per 100,000 over white US females; meanwhile white females in Mississippi (with a rate of 22.7 per 100,000) held an advantage of 1.1 per 100,000. Over the 1979 to 2005 period, rates of colorectal cancer mortality dropped for white
females both in MS and across the nation. However, because this decline was slower among white females in Mississippi, their advantage over their national counterparts has disappeared in recent years.

Meanwhile, rates of colorectal cancer mortality rose among black females in Mississippi. By 1991, the advantage black females held over their white national counterparts disappeared, and a disadvantage for black females in Mississippi emerged and grew rapidly. In 2005, black MS females (with a rate of 24.3 per 100,000) saw 10 more colorectal cancer deaths per 100,000 compared to the white national counterparts.

<table>
<thead>
<tr>
<th>Colorectal Cancer Mortality (per 100,000)</th>
<th>1979</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>32.6</td>
<td>20.4</td>
</tr>
<tr>
<td>MS white male</td>
<td>25.6</td>
<td>21.8</td>
</tr>
<tr>
<td>MS black male</td>
<td>21.0</td>
<td>28.9</td>
</tr>
<tr>
<td>US white female</td>
<td>23.8</td>
<td>14.3</td>
</tr>
<tr>
<td>MS white female</td>
<td>22.7</td>
<td>14.4</td>
</tr>
<tr>
<td>MS black female</td>
<td>19.3</td>
<td>24.3</td>
</tr>
</tbody>
</table>
RECOMMENDED COLORECTAL CANCER SCREENING

Colorectal cancer can be detected in early stages with Fecal Occult Blood Tests (FOBT) and sigmoidoscopy. Doctors recommend that adults over the age of 50 have an FOBT annually and a sigmoidoscopy regularly (American Cancer Society, 2008).

Mississippi, the Nation, and Healthy People 2010

Using the respective 1998 US rates of 35% and 37% as baselines, Healthy People 2010 calls for 50% of adults over age 50 to have had a recent FOBT (in the previous 2 years) and a sigmoidoscopy at least once.

Disturbingly, the number of US adults having received a recent FOBT has declined in recent years (dropping to 25.3% in 2007). In Mississippi, on the other hand, rates of FOBT screening remained fairly static (at 21.9% in 2001 and 22.9% in 2006). As a result, the disparity between the US and Mississippi has lessened. The Mississippi FOBT rate trailed the US rate by 2.0% in 2006. Given these trends, Mississippi and the US are highly unlikely to reach the Healthy People goal in 2010.

Meanwhile, the number of adults ever receiving a sigmoidoscopy are on the rise, with US adults already meeting and exceeding the Healthy People goal by 2007 (with a rate of 63%). Mississippians, while trailing the nation, also met the Healthy People goal (rates rising from 41.1% in 2001 to 51.7% in 2006). However, the disparity between Mississippi and the US is increasing; in 2006, Mississippi trailed the nation in sigmoidoscopy by 8.7%.
The disparity between Mississippian and the US decreased for recent Fecal Occult Blood Test screening but increased for sigmoidoscopies.

Compared to MS males, females in Mississippi saw lower rates of recent FOBT screening as well as greater disparities from national rates.

<table>
<thead>
<tr>
<th>Recently received a blood stool Test</th>
<th>2001</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>34.6%</td>
<td>26.7%</td>
</tr>
<tr>
<td>MS white male</td>
<td>25.8%</td>
<td>28.6%</td>
</tr>
<tr>
<td>MS black male</td>
<td>23.1%</td>
<td>24.2%</td>
</tr>
<tr>
<td>US white female</td>
<td>34.5%</td>
<td>25.3%</td>
</tr>
<tr>
<td>MS white female</td>
<td>20.7%</td>
<td>20.0%</td>
</tr>
<tr>
<td>MS black female</td>
<td>13.6%</td>
<td>17.7%</td>
</tr>
</tbody>
</table>

**Mississippians: How Have We Compared?**

While FOBT screening has declined among white US males (from 28% receiving a recent FOBT in 2000 to 25% in 2007), screening rates have remained relatively static among both white and black Mississippian. White males in Mississippi, who held an advantage of 1.9% over their white national counterparts in 2006, actually saw FOBT screening rates rise overall from 2001 to 2006 (from 25.8% to 28.6%), however data is insufficient to classify this as a true departure from stability to an upward trend.

While black Mississippian achieved recent FOBT screening at lower rates than their national white counterparts, the disparity between these two groups is decreasing rapidly. As rates of FOBT screening dropped among white US males, rates for black MS males rose slightly (from 23.1% in 2001 to 24.2% in 2006), and the disparity between the two groups fell from almost 5% to a mere 2.5%.
White females across the US saw an even more severe decline in FOBT (from 33.6% in 2000 to 26.7% in 2007). Moreover, in a reversal of typical patterns, the disparity in screening between MS females and US females is actually larger than that between MS and US males. Less severe drops in rates of screening for white MS females (from 20.7% in 2001 to 20% in 2006) led to a drop in disparity, with 5.3% fewer white females in Mississippi screened in 2006 compared to US females. While black females saw the lowest rates of screening, their screening rates actually rose over the observed period (from 13.6% in 2001 to 17.7% in 2006), and the disparity in FOBT screening between black MS females and white US females dropped from 20.9% to 7.6%.

While FOBT screening has declined for the country, Mississippians have seen static to slightly increasing rates of this low-cost screening. On the other hand, the percentage of Americans having had a sigmoidoscopy, a more effective screening tool, has increased rapidly, while Mississippians lag behind.
Sigmoidoscopy screening rose for all groups over the observed period. However, rates for Mississippians lagged behind national rates. Disparity between white MS males (whose rates rose from 39.5% to 54% between 2001 and 2006) and their national counterparts (whose rates rose from 49.2% to 66.7% between 2000 and 2007) decreased slightly; 12% fewer white MS males had received screening compared to their national counterparts in 2001; this disparity dropped to 9.8% in 2006. Black males in Mississippi did much more poorly (rates rising from 23.2% to 40.6%) and saw no real change in disparity. 23.2% fewer black MS males had received sigmoidoscopy screening compared to their white national counterparts in 2006.

Compared to MS males, females in Mississippi (particularly white females) saw higher rates of sigmoidoscopy screening as well as less disparity from national rates. This pattern lies in opposition to the pattern seen for FOBT testing among males versus females.
White females in the US (with rates that rose from 42.1% to 63.3% between 2000 and 2007) are actually screened at slightly lower rates than white US males. In contrast, white and black females in Mississippi saw higher rates than MS males and smaller disparities. White MS females tracked slightly beneath white US females (a rate of 47% in 2001 rising to 58.1% in 2006); 4.2% fewer white MS females received recent sigmoidoscopy screenings in comparison to their national counterparts. Black females in Mississippi began the decade with a rate (46.8%) very similar to those of white MS females. However, rates dropped for black MS females (42.6% in 2006), leaving them with only a very small advantage over their male partners by the end of the observed period. Black females in Mississippi trailed white US females by 19.7% in 2006.

<table>
<thead>
<tr>
<th>Ever received a sigmoidoscopy</th>
<th>2001</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>51.5%</td>
<td>63.8%</td>
</tr>
<tr>
<td>MS white male</td>
<td>39.5%</td>
<td>54.0%</td>
</tr>
<tr>
<td>MS black male</td>
<td>23.2%</td>
<td>40.6%</td>
</tr>
<tr>
<td>US white female</td>
<td>49.9%</td>
<td>62.3%</td>
</tr>
<tr>
<td>MS white female</td>
<td>47.0%</td>
<td>58.1%</td>
</tr>
<tr>
<td>MS black female</td>
<td>46.8%</td>
<td>42.6%</td>
</tr>
</tbody>
</table>

Because we were not equal...
- 4.2% fewer white females in Mississippi
- 9.8% fewer white males in Mississippi
- 19.7% fewer black females in Mississippi
- 23.2% fewer black males in Mississippi

...had ever received a sigmoidoscopy in 2006.
REFERENCES


OBESITY, CARDIOVASCULAR DISEASE & DIABETES

AUTHORS: Lindsay Jones, M.S.; Sangeetha Shivaji, M.S.; Arthur G. Cosby, Ph.D.; Tara Morgan

With the Advice of: Marshall Bouldin, M.D.; Herman A. Taylor, Jr., M.D., M.P.H.

IN THIS SECTION:

OBESITY
- Healthy Weight
- Obesity
- Obesity and Mortality
- Risk Factor: Exercise

HEART DISEASE & STROKE
- Coronary Heart Disease Mortality
- Stroke Mortality
- Risk Factor: High Blood Pressure
- Risk Factor: High Blood Cholesterol

DIABETES
- Diagnosis
- Prevention and Control
- Diabetes Mortality
Since 1900, with the exception of one year, cardiovascular disease has been the greatest cause of mortality in America.

While cardiovascular disease mortality is declining, it remains our nation’s leading cause of death, and Mississippians are dying of coronary heart disease and stroke at even greater rates than the nation. Meanwhile, incidence of obesity and diabetes is on the rise (American Heart Association (AHA), 2009b). 75% of diabetics die of heart or blood vessel disease, diabetes is currently the sixth leading cause of death in America, and obesity is deeply intertwined with both cardiovascular disease and diabetes (AHA, 2009b; Mayo Clinic Health Manager, 2009a). These interrelated difficulties cost our nation hundreds of billions of dollars in both direct expenses as well as indirect expenses such as work missed and years of productivity lost.
OBESITY

HEALTHY WEIGHT

The Body Mass Index (BMI) measure uses height and weight to calculate adult body fat composition. Healthy People 2010 designates individuals with a BMI under 18.5 as underweight, individuals with a BMI of 25 or higher as overweight, and individuals with a BMI of 30 or higher as obese. People at ‘healthy weight’ fall between BMIs of 18.5 and 24.9. It is important to note that while these cutpoints are currently used by Healthy People, they are not absolute. Some arguments have been made for variations in definitions of ‘healthy weight’ for different groups.

Source: CDC, Behavioral Risk Factor Surveillance System (BRFSS), Prevalence and Trends Data, 2008

Individuals with a Body Mass Index (BMI) of 30 or higher are generally designated as obese.
Mississippi, the Nation, and Healthy People 2010

Using the 1998 rate of 42% of adults (aged 20 years and older) at healthy weight as a baseline, Healthy People calls for 60% of adults to attain a healthy weight by 2010. Unfortunately by 2007, the percent of US adults attaining healthy weight had actually declined (to 37.9%) (DHHS, Healthy People 2010, n.d.).

Similarly, the proportion of individuals at a healthy weight in Mississippi dropped (from 38.2% in 2000 to 32.6% in 2007). Neither MS nor the US is moving towards the Healthy People target. Moreover, the disparity between MS and the US rose from 4% fewer Mississippian at healthy weight in 2000 to 5% fewer in 2007.

Mississippian: How Have We Compared?

From 2000 to 2007, the number of white males in the US at a healthy weight decreased by 4.8% (from 34.5% to 29.7%). In Mississippi, the number of white males at a healthy weight declined by 3.4% (from 30.1% to 26.7%). Because this decline was less rapid, the healthy weight disparity between white males in MS and the US actually fell.

Black Mississippi males saw a similar overall drop in healthy weight achievement (from 28.7% to 25.6%) and thus saw a similar reduction in disparity. In fact, rates of healthy weight among black males in Mississippi actually exceeded US white male rates twice over the observed period but dropped again in the last observed year.

5% more Mississippian would have achieved healthy weight in 2007 if we achieved like the nation.
Rates of healthy weight among black and white males in Mississippi are similar. Disparity between white males in the US and (both black and white) males in Mississippi is decreasing. Unfortunately, the reduction in disparities is not a result of improved health status (i.e. greater rates of healthy weight) but rather results from worsening health of US males.

While white females achieve healthy weight at much higher levels than men, healthy weight also declined. Rates of healthy weight among white females in the US dropped less sharply (from 52.6% in 2000 to 48.1% in 2007) than among white MS females (53.4% to 45.3%), creating a previously unseen disparity.

Rates of healthy weight among black females are hugely disparate in comparison to white US females as well as white MS females. In fact, black females fall (from 26.5% to 24.6%) behind all male groups as well.

Rates of healthy weight among black and white males in Mississippi are similar. Disparity between white males in the US and (both black and white) males in Mississippi is decreasing. Unfortunately, the reduction in disparities is not a result of improved health status (i.e. greater rates of healthy weight) but rather results from worsening health of US males.

While white females achieve healthy weight at much higher levels than men, healthy weight also declined among females. Moreover, disparity rose between white females in Mississippi and across the US.

This rise in disparity did not occur for black females, but this is small comfort when rates of healthy weight among black females are almost half those seen for white females across the nation. 3 out of every 4 black females in Mississippi failed to achieve a healthy weight in 2007.

### Healthy Weight

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>34.5%</td>
<td>29.7%</td>
</tr>
<tr>
<td>MS white male</td>
<td>30.1%</td>
<td>26.7%</td>
</tr>
<tr>
<td>MS black male</td>
<td>28.7%</td>
<td>25.6%</td>
</tr>
<tr>
<td>US white female</td>
<td>52.6%</td>
<td>48.1%</td>
</tr>
<tr>
<td>MS white female</td>
<td>53.4%</td>
<td>43.5%</td>
</tr>
<tr>
<td>MS black female</td>
<td>26.5%</td>
<td>24.6%</td>
</tr>
</tbody>
</table>

**NOTE:** In tables, red data represent a worsening rate or percentage over the observed time period. Green data represent an improvement in rate or percentage.

**NOTE:** Measurements of equality employ national white data as the standard for comparison.
OBESITY

Obesity stems from a combination of hereditary and environmental sources. Commonly recognized risk factors for obesity include family history, age, smoking cessation, socioeconomic issues, and genetics (Mayo Clinic Health Manager, 2009a).

Conditions of overweight and obesity correlate with increased risks for coronary heart disease, type 2 diabetes, cancers, high blood pressure, high cholesterol, stroke, liver and gallbladder disease, respiratory difficulties, osteoarthritis, and gynecological difficulties (CDC, 2009a). The obesity epidemic is growing rapidly.

Mississippi, the Nation, and Healthy People 2010

Using the 1998 national rate of 23% as a baseline, Healthy People calls for reduction of obesity among adults to 15% by 2010. Unfortunately, obesity in the US has risen (to 25.7% by 2007).

In Mississippi, prevalence of obesity was even higher overall and rose more rapidly (from 26.5% in 2000 to 32% in 2007). Both MS and the nation are moving away from the Healthy People target.

“If in 2000, the total cost of obesity in the United States was estimated to be $117 billion—$61 billion for direct medical costs and $56 billion for indirect costs”

(CDC, 2008, The Cost of Obesity and Chronic Diseases section).
Mississippians: How Have We Compared?
Rates of obesity between US and MS white males show a steady rise from 2000 to 2007 (from 20.0% and 23.2%, respectively, to 26.3% and 28.7%, respectively). While seeing a smaller rise in rates over the observed period (from 31.9% in 2000 to 36.1% in 2007), black males in Mississippi are much more likely to be obese.

More than 1 in every 3 black men in Mississippi suffered from obesity in 2007.

While disparities exist between various groups for many health indicators, by and large the health of Americans, including Mississippians, is improving overall thanks to improvements in prevention, treatment, and other factors.

Obesity, however, stands out, in that it is a health condition that is worsening for the entire country, with Mississippi leading the nation in this disturbing trend.
In 2000, white females in MS and the US suffered from obesity at similar rates compared to their male counterparts. However, since then obesity prevalence has remained fairly static for white women (moving from 21.9% to 22.8% from 2000 to 2007 for white US women and from 22.7% to 25.4% for white MS women). As a result, obesity for white women is now lower than that for white men.

In contrast, obesity rates among black females in Mississippi have remained much higher than the rates of their male counterparts, and these rates are on the rise (from 38.5% in 2000 to 47.4% in 2007). As with healthy weight achievement, black MS women perform worse than all other groups.

Because we were not equal...

<table>
<thead>
<tr>
<th></th>
<th>US White</th>
<th>MS White</th>
<th>MS Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>3% more white females in Mississippi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2% more white males in Mississippi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10% more black males in Mississippi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25% more black females in Mississippi</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

...were obese in 2007.

Obesity rose more rapidly among white men compared to white women from 2000 to 2007. In contrast, obesity for black women in Mississippi rose at double the rate seen for black males.

The shocking levels of obesity found among black women in Mississippi represent, by far, the largest disparity found in our entire study. As of 2007, almost half of all black women in Mississippi were obese.

Black Mississippi women were more than twice as likely to be obese compared to white women across the nation. Health disparities of this unusual magnitude are indicative of a profound health issue facing our state.
OBESITY & MORTALITY

Mississippi, the Nation, and Healthy People 2010

Data on mortality with obesity as the underlying cause is rarely reliable. Obesity is more reliably listed as one of multiple causes of death. Healthy People 2010 calls for reduction of obesity-related mortality by 2010; unfortunately, rates of obesity-related mortality are increasing across the United States and Mississippi.

From 1999 to 2004, US deaths related to obesity (as defined by the CDC Multiple Cause of Death file) rose (from 4.9 per 100,000 to 6.7 per 100,000). In Mississippi, the rate of deaths related to obesity grew even more rapidly (from 5.4 to 9 per 100,000), the disparity between MS and the US more than quadrupled from 0.5 to 2.3 per 100,000 excess deaths.

Mississippians: How Have We Compared?

As with obesity prevalence, obesity-related mortality is on the rise for all groups, with black females suffering the most. From 1999 to 2004, white males in Mississippi saw mortality increase more rapidly (3.6 to 7.3 per 100,000) than mortality among white males across the nation (4.6 to 6.4 per 100,000); as a result, white Mississippi males lost the advantage they held in 1999.

While rising more slowly, mortality remained much higher among black males in Mississippi (from 6.2 per 100,000 deaths to 8.6 in 2004).
In 1999, white males in Mississippi actually performed better in obesity-related mortality than their national counterparts. However, by 2004, 0.9 per 100,000 more white males in Mississippi died of obesity-related causes.

1 in 4 obesity-related deaths among black males in Mississippi in 2004 would have been averted if Mississippi had achieved white national rates.

White female rates of obesity-related mortality were similar to male rates. From 1999 to 2004, rates for white females rose in the US (from 4.1 to 5.7 per 100,000) and in Mississippi (4.8 to 5.7 per 100,000). Note that while the white MS female rate is identical to the white US rate in 2004, the previous two years each saw more than 7 per 100,000 deaths in Mississippi – 1.3 per 100,000 more deaths for white MS females compared to the nation. Meanwhile, the rate of obesity-related mortality for black females in Mississippi more than doubled from 1999 to 2004, skyrocketing from 8.7 per 100,000 to 18.7 per 100,000 – more than triple the white US female rate.

Black females in Mississippi suffer the worst in terms of obesity-related mortality, and rates are skyrocketing.

More than 2 out of every 3 obesity-related deaths among black females in Mississippi would have been averted if Mississippi had achieved white national rates in 2004.

Because we were not equal...

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>4.6</td>
<td>6.4</td>
</tr>
<tr>
<td>MS white male</td>
<td>3.6</td>
<td>7.3</td>
</tr>
<tr>
<td>MS black male</td>
<td>6.2</td>
<td>8.6</td>
</tr>
<tr>
<td>US white female</td>
<td>4.1</td>
<td>5.7</td>
</tr>
<tr>
<td>MS white female</td>
<td>4.8</td>
<td>5.7</td>
</tr>
<tr>
<td>MS black female</td>
<td>8.7</td>
<td>18.7</td>
</tr>
</tbody>
</table>

Obesity-Related Mortality (per 100,000) 1999-2004

Source: CDC, Compressed Mortality Data, n.d.c
Will we have food for our next meal? Through the establishment of food programs to prevent hunger amongst the poor, the government has addressed a once-overwhelming fear for low-income families. Food subsidies allow families who might otherwise go hungry to put food on the table. However, with little instruction on how to stretch that money to create healthy meals, many families feel they must resort to “the center aisles” or fall short in their ability to feed their family. The center-aisle phenomenon describes over-utilization of foods located in the center aisle of the grocery store, such as pre-made meals, boxes, and canned goods, due to perception of these foods as the least expensive and easiest to prepare. Unfortunately, many of these foods contain high amounts of added sodium and sugars and are typically higher in calories than home-cooked alternatives.

In response to the developing obesity epidemic, a public push to help people pursue healthier eating choices has risen in recent years. One such approach is Linda Watson’s innovative shopping and cooking program, known as Cook for Good. Watson developed this plan after hearing policy makers argue that greater subsidies are necessary for people to eat healthily on government support. Using only those resources a family of four could obtain with current government subsidies, she is developing a series of cookbooks that allow healthy eating. These books encourage utilization of low cost alternatives to the center aisles, such as healthy in-season vegetables and fruits, as well as the heroes of the center aisle: beans, rice, and whole grains. Providing healthy and economic consumption plans, such as Cook for Good, to families on government subsidies would promote healthy lifestyles and combat obesity at all income levels (Watson, n.d.).
RISK FACTOR: EXERCISE

Mississippi, the Nation, and Healthy People 2010
Using the 1997 US rate of 60% adult engagement in physical activity as a baseline, Healthy People seeks engagement in any type of physical exercise by 80% of adults by 2010. From 2000 to 2007, physical activity by US adults rose slightly (from 72.3% to 75.9%). These percentages are solid improvements over the 1997 baseline, but the US may not reach the Healthy People goal by 2010.

From 2000 to 2007, Mississippi engagement fluctuated (around 67%) but remained largely unchanged overall (at 68.4% in 2007). Mississippi is not progressing toward the Healthy People goal.

Mississippians: How Have We Compared?
From 2000 to 2007, white male engagement in physical activity rose (from 77.5% to 81.1%) in the US. Meanwhile, white male engagement in Mississippi remained fairly stable (fluctuating between 72% and 76%, and at 74.7% in 2007). As a result, the disparity between white males in Mississippi and the US has grown.

Black males in Mississippi performed even more poorly, with similarly static rates of physical activity (fluctuating between 70% and 66%, and at 67.9% in 2007).
“In 2000, health care costs associated with physical inactivity topped $76 billion. If 10% of adults began a regular walking program, $5.6 billion in heart disease costs could be saved” (CDC, 2008).

Females engaged in physical activity at lower levels than males. However, as with white US males from 2000 to 2007, the percent of white US females engaging in physical activity rose by 3.3% (from 73.4% to 76.7%). White Mississippi females, like their male counterparts, saw fairly stable levels of physical activity (at 67.1% in 2000 and 67.4% in 2007).

Meanwhile, engagement in physical activity by black females in Mississippi, while rising, was the lowest among all groups (rising from 54.9% in 2000 to 58.6% in 2007).

Black females in Mississippi lag significantly in achievement of healthy weight and appropriate levels of physical activity and suffer obesity and obesity-related mortality at much greater levels, compared to all other groups investigated here.

However, all of the female groups investigated (white US women, white MS women, and black MS women) lagged behind men in exercise levels.

The question of why black women in Mississippi suffer so much more with regards to problems of weight must be addressed to improve the health of Mississippi as a whole.
Exercise provides a multitude of general health benefits – bettering bone and muscle strength, blood pressure levels, mental health, and mood. Exercise also reduces the risk of cardiovascular disease, diabetes, and some cancers.

However, the role of exercise in combating obesity is complicated, with diet playing a larger role in weight loss than exercise. A study released in January 2009 compared African American women in metropolitan Chicago (averaging 184 pounds) with women in rural Nigeria (averaging 127 pounds). Unexpectedly, the Nigerian women did not differ in physical activity (calorie expenditure through exercise). Instead, the difference in diet between the two groups seemed to be the source of their differing weights (Ebersole, et al., 2008; LiveScience Staff, 2009).

While exercise does burn calories, people who exercise tend to eat more to compensate for this loss. “Evidence is beginning to accumulate that dietary intake may be more important than energy expenditure level. Weight loss is not likely to happen without dietary restraint” (MedicineWorld.org, n.d., as cited from Obesity, para. 10, 2009).

However, a study from University of Alabama Birmingham (UAB) strongly supports the idea that exercise is imperative for a certain type of fat loss—visceral fat loss (UAB Media Relations, 2009). Body fat exists in two forms: subcutaneous fat, the layer of fat below the skin that contributes to the appearance of obesity; and visceral fat, the fat that lies beneath muscles, surrounding organs, which is invisible to the naked eye and only detectable by MRI. The liver metabolizes visceral fat to create blood cholesterol. Visceral fat puts individuals at risk for developing diabetes type 2 and heart disease and has been associated with colorectal and breast cancer (Harvard Health Publications, 2006).

The UAB study compared 45 Caucasian and 52 African-American women, randomly separated into three groups – two exercise groups (aerobic training and resistance training) and one no-exercise group. Every woman participated in an 800 calorie-a-day diet, and average weight loss for the group was 24 pounds. Total fat, subcutaneous fat, and visceral fat were measured for each participant. Then, diet restraints were lifted and the two exercise groups were asked to continue exercising 40 minutes, twice a week for one year. A year later, subjects were divided into those who maintained aerobic exercise, those who stopped aerobic exercise, those who maintained their resistance training, those who stopped resistance training, and those who were never placed on an exercise regimen. Those who continued exercising had experienced modest overall weight regain, but absolutely no regain of visceral fat. Those who stopped exercising or who never exercised saw a 33% visceral fat increase (UAB Media Relations, 2009).
Hence, while studies find that diet is more effective in weight loss overall, exercise remains extremely important for control of visceral fat and thus holds important implications for the control of blood cholesterol, depression, diabetes type 2, and cardiovascular disease – the most damaging consequences of obesity on health.

The National Weight Control Registry (NWCR) was created to track individuals who have lost significant weight and kept it off, with the goal of identifying important factors in weight loss and maintenance. 98% of individuals tracked had modified their food intake, while 94% increased their physical activity (National Weight Control Registry, n.d.).
HEART DISEASE & STROKE

CORONARY HEART DISEASE MORTALITY

Coronary Heart Disease occurs when buildups of plaque (composed of fatty substances such as cholesterol) in the coronary arteries block blood flow to the heart, which can in turn result in a heart attack (CDC, 2009d). Coronary heart disease (CHD) is the leading cause of death for men and women in the United States.

Mississippi, the Nation, and Healthy People 2010

Using the 1998 US rate of 208 CHD deaths per 100,000 as a baseline, Healthy People calls for reduction of coronary heart disease mortality to 166 deaths per 100,000 by 2010. The US achieved the Healthy People CHD goal in 2004 and 2005 (with mortality falling to 156.4 per 100,000 in 2005).

While national rates of coronary heart disease mortality have declined consistently since 1979, Mississippi CHD mortality only began a steady decline in the late 1980s. Based on recent trends (with a rate of 186 per 100,000 in 2005), Mississippi might achieve the Healthy People 2010 goal. Unfortunately, Mississippians, who originally achieved lower CHD mortality than the nation, suffered nearly 30 excess CHD deaths per 100,000 compared to the nation in 2005.

Risk factors for coronary heart disease include high blood cholesterol levels, high blood pressure, diabetes, tobacco use, diets high in saturated fats and cholesterol, physical inactivity, obesity, and excessive alcohol consumption (CDC, 2009c).

“The estimated direct and indirect 2009 cost of CHD is $165.4 billion”

(American Heart Association (AHA), 2009b, p. 13).

CHD mortality has reduced consistently in Mississippi in recent years. However, rates are still higher than those seen across the nation. Disparities between Mississippi and the nation have actually narrowed slightly in recent years.
“The burden of heart disease and stroke cannot be measured by death statistics alone. The cost of heart disease and stroke in the United States, including health care expenditures and lost productivity from deaths and disability, is projected to be more than $475 billion in 2009. As the U.S. population ages, the economic impact of cardiovascular diseases on our nation’s health care system will become even greater”

(National Center for Chronic Disease Prevention and Health Promotion, 2009, p. 2).

Mississippians: How Have We Compared?

From 1979 to 2005, white males across the US have seen a steady decline in CHD mortality (from 471.1 to 196 deaths per 100,000). White males in Mississippi also saw a decline in CHD mortality. However, the decline (from 463.5 per 100,000 to 230.2 per 100,000) was not as steady or rapid, and white MS males lost the 7.6 per 100,000 advantage they initially held over white US males.

Black Mississippi males (with a rate of 357.2 per 100,000) started with an exponentially larger advantage of 113.9 per 100,000 over their white national counterparts. However, rates of mortality for black MS males, which actually rose in the late 1980s, fell more slowly than and soon exceeded national white rates (rates for black MS males at 262 per 100,000 in 2005).

Males and females in Mississippi are seeing a rising disparity in CHD mortality compared to white US rates. Black females in Mississippi are the exception to this rule, with less disparity in 2005 compared to previous years.

However black Mississippians, both male and female, see the highest overall rates of CHD mortality. 1 in 4 CHD deaths among black Mississippians would have been averted if Mississippi had achieved white national rates.
Females experienced lower rates of CHD mortality but in similar patterns. Rates for white US females fell (from 264.6 to 117.2 per 100,000) from 1979 to 2005. A slower rate of improvement among white MS females compared to the nation resulted in a loss of an early advantage of 12.5 per 100,000 (with mortality among white MS females dropping from 252.1 in 1979 to 134 per 100,000). Black female CHD mortality rates rose in the late 1980s, and, overall from 1979 to 2005, CHD mortality among black females saw a comparatively slow decline (267.1 to 166.2 per 100,000).

“**African American adults are less likely to be diagnosed with coronary heart disease, however they are more likely to die from heart disease**”

(OMH, n.d., Heart Disease and African Americans section, para. 1).

<table>
<thead>
<tr>
<th>Coronary Heart Disease Mortality (per 100,000)</th>
<th>1979</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>471.1</td>
<td>196.0</td>
</tr>
<tr>
<td>MS white male</td>
<td>463.5</td>
<td>230.2</td>
</tr>
<tr>
<td>MS black male</td>
<td>357.2</td>
<td>262.0</td>
</tr>
<tr>
<td>US white female</td>
<td>264.6</td>
<td>117.2</td>
</tr>
<tr>
<td>MS white female</td>
<td>252.1</td>
<td>134.0</td>
</tr>
<tr>
<td>MS black female</td>
<td>267.1</td>
<td>166.2</td>
</tr>
</tbody>
</table>

Because we were not equal...

- 153 more white females in Mississippi
- 280 more black females in Mississippi
- 301 more white males in Mississippi
- 335 more black males in Mississippi

...died of coronary heart disease in 2005.
Heart disease can be divided into two categories, ischemic and non-ischemic. Ischemic heart disease is “the term given to heart problems caused by narrowed heart arteries” (AMA, 2010b, What is ischemic heart disease section, para. 1). Blocked arteries result in less blood and oxygen reaching the heart and can lead to heart attack. Coronary heart disease is an ischemic heart disease, caused by “the narrowing of the coronary arteries due to fatty buildups of plaque” and frequently produces chest pain and heart attacks (AHA, 2010a, Coronary Heart Disease section, para. 1).

Non-ischemic heart disease is not related to poor arterial blood circulation and may take several forms, the most common of which is dilated cardiomyopathy, where a weakening of the muscle walls in a pumping chamber of the heart leads to decreased ability to pump blood. This condition “frequently [results] if fluid builds up in the legs, feet, ankles, lungs, and other organs” (AHA, 2010) and is termed congestive heart failure (MetroHealth System, 2009, What is Dilated Cardiomyopathy section).

High blood pressure and diabetes are major contributors to congestive heart failure (AHA, 2010a). 19% of all congestive heart failure patients suffer from diabetes, and diabetes patients are two to eight times more likely to experience congestive heart failure (Kannel, 2000). The survival rate for heart failure victims is only 35% (Bleumink et al., 2004). As rates of high blood pressure and diabetes rise, we can expect to see rising rates of non-ischemic heart disease.

The Jackson Heart Study (JHS) was established to investigate higher rates of cardiovascular disease among African Americans. The study, a collaboration between three academic institutions (Jackson State University, Tougaloo College, and the University of Mississippi Medical Center), the Jackson, Mississippi, community, and the National Institutes of Health is “the largest single-site, prospective, epidemiologic investigation of cardiovascular disease among African Americans ever undertaken” (National Institutes of Health (NIH), n.d.a).

Participants are adult African Americans between aged 35 to 84 years. An initial exam of participants involves a physical exam and obtains at medical history, blood/urine analytes, and information on “physical activity; stress, coping and spirituality; racism and discrimination; socioeconomic position; and access to health care” (National Institutes of Health (NIH), n.d.b, para 1). The study then monitors the health of participants through yearly telephone interviews. The applications for this rich data set are wide ranging. However, the major objective of this study is to identify factors influencing the incidence and severity of CVD in African Americans, particularly with regards to aspects of CVD related to high blood pressure (NIH, n.d.a).
STROKE MORTALITY

Strokes result from damage to parts of the brain, via blockage of blood supply or bursting of blood vessels in or near to the brain (CDC, 2007). Stroke is the third leading cause of death in the United States.

Mississippi, the Nation, and Healthy People 2010

Using the 1998 US rate of 60 stroke deaths per 100,000 as a baseline, Healthy People calls for reduction of stroke deaths to 48 per 100,000 by 2010. By 2005, the US had met this goal (with a stroke mortality rate of 46.9 per 100,000).

In Mississippi, rates of stroke mortality were higher but also declined (68.3 deaths in 1998 reducing to 55.5 per 100,000 in 2005). If current trends continue, Mississippi should also achieve the Healthy People goal by 2010.

Mississippians: How Have We Compared?

From 1979 to 2005, mortality among white males across the US declined (from 100.2 to 44.7 deaths per 100,000), while mortality for white males in Mississippi declined even more sharply (from 120.4 to 53.4 per 100,000). These trends represent reducing disparity between white males across the US and in Mississippi, from 20.2 per 100,000 excess stroke deaths in Mississippi in 1979 to only 8.7 per 100,000 excess stroke deaths in 2005.
Approximately 50% of stroke deaths and 25% of coronary heart disease deaths for black MS males would be eliminated if there were no disparities.

![Stroke Mortality Graph](image)

Source: CDC, Compressed Mortality Data, n.d.c; n.d.d

<table>
<thead>
<tr>
<th>Stroke Mortality (per 100,000)</th>
<th>1979</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>100.2</td>
<td>44.7</td>
</tr>
<tr>
<td>MS white male</td>
<td>120.4</td>
<td>53.4</td>
</tr>
<tr>
<td>MS black male</td>
<td>174.2</td>
<td>91.8</td>
</tr>
<tr>
<td>US white female</td>
<td>89.8</td>
<td>44.0</td>
</tr>
<tr>
<td>MS white female</td>
<td>102.4</td>
<td>45.2</td>
</tr>
<tr>
<td>MS black female</td>
<td>138.7</td>
<td>57.4</td>
</tr>
</tbody>
</table>

Disparity between white MS females and white females across the nation has all but disappeared. In contrast, roughly **1 in 4 deaths** among black females in Mississippi could have been averted in 2005 if we were equal.

Because we were not equal...

- 11 more white females in Mississippi
- 76 more black females in Mississippi
- 77 more white males in Mississippi
- 239 more black males in Mississippi

...died of stroke in 2005.

Rates of stroke mortality for black males in Mississippi, while also dropping, are significantly worse at 174.2 per 100,000 in 1979 and at 91.8 per 100,000 in 2005. In 2005, black males in Mississippi died at a rate more than double the rate at which white US males died.

White females perform similarly to their male counterparts with regards to stroke mortality, though at slightly lower levels. Stroke mortality for white females across the US declined from (89.8 in 1979 to 44 per 100,000 in 2005). Meanwhile, stroke mortality for white MS females fell even more quickly (from 102.4 to 45.2 per 100,000), meeting national rates. Similar to patterns among males, rates for black females were significantly higher (dropping from 138.7 to 57.4 per 100,000).

“**The estimated direct and indirect cost of stroke for 2010 is $73.3 billion**”

(AHA, 2010c, p. 17).
Risk factors for stroke include high blood pressure, heart disease, irregular heartbeat, diabetes, tobacco use, and family history of stroke. Knowing the symptoms of stroke, calling for medical help right away, and getting to a hospital as quickly as possible are crucial to avoiding the most damaging consequences of a stroke; however, the best treatment is prevention (CDC, n.d.a). Stroke survivors can suffer from severe disabilities such as paralysis and speech and emotional difficulties (CDC, n.d.b).

RISK FACTOR: HIGH BLOOD PRESSURE

Blood pressure refers to two measurements, the force of blood in the arteries when the heart beats and then when the heart is at rest. Persons with high blood pressure are at higher risk for coronary heart disease and stroke (AHA, 2009) as well as congestive heart failure and kidney disease (CDC, 2009d).

Mississippians: How Have We Compared?

Between 2001 and 2007, 7% more Mississippians (at 33%) reported high blood pressure compared to individuals across the US (at 26%).

Black Mississippian we have particularly high risk. While white males across the US and in Mississippi suffered from high blood pressure at an average rate of 28% and 30%, respectively, 35% of black males in Mississippi suffered high blood pressure. Black females in Mississippi were at highest risk. While white females across the US and in Mississippi suffered from high blood pressure at a rate of 26% and 30%, respectively, 42% of black females in Mississippi suffered high blood pressure.

On average from 2001 to 2007, 1 in 3 Mississippers suffered from high blood pressure. More than 1 in 5 cases of high blood pressure would have been averted in Mississippi if we had achieved like the nation.

People who are over the age of 35, African American, obese, or heavy drinkers are at risk for high blood pressure, as are women on birth control pills and persons with a family history of blood pressure (American Heart Association, 2009).
Among black males in Mississippi, 1 in 5 cases of high blood pressure would have been averted if Mississippi had achieved white national rates. More than 1 in 3 cases among black females in Mississippi would have been averted.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>US white male</td>
<td>28%</td>
</tr>
<tr>
<td>MS white male</td>
<td>30%</td>
</tr>
<tr>
<td>MS black male</td>
<td>35%</td>
</tr>
<tr>
<td>US white female</td>
<td>26%</td>
</tr>
<tr>
<td>MS white female</td>
<td>30%</td>
</tr>
<tr>
<td>MS black female</td>
<td>42%</td>
</tr>
</tbody>
</table>

Because we were not equal...
- 3% more white males in Mississippi
- 4% more white females in Mississippi
- 7% more black males in Mississippi
- 16% more black females in Mississippi
...suffered from high blood pressure on average between 2001 and 2007.

“Although African American adults are 40% more likely to have high blood pressure, they are 10% less likely than their non-Hispanic White counterparts to have their blood pressure under control”

(OMHD, n.d., Heart Disease and African Americans section, para. 1).

In 2006, high blood pressure engendered 44,879 million office visits. When estimates include indirect as well as direct costs, high blood pressure cost the country $63.5 billion in 2006 and is predicted to cost $73.4 billion in 2009

(CDC, 2007b; AHA, 2009).
RISK FACTOR: HIGH BLOOD CHOLESTEROL

Cholesterol is an essential component of the body. However, when too much cholesterol accumulates in the blood, it can build up as fatty deposits in blood vessels. These blockages can lead to heart attack or stroke (Mayo Clinic Health Manager, 2008).

Mississippians: How Have We Compared?

Between 2001 and 2007, approximately 35% of individuals across the United States reported diagnoses of high blood cholesterol. Mississippi achieved at the same level as the nation.

White males in Mississippi performed 1% better than white males across the US (37%), and black males in MS bettered white US males by 7%. Black females in Mississippi also outperformed whites, with 2% fewer black females (at 32%) diagnosed with high blood cholesterol compared to white US females (at 34%).

However, 3% more white females (at 37%) in MS suffered high blood cholesterol in comparison to their national counterparts.

“High cholesterol (hypercholesterolemia) is largely preventable and treatable. A healthy diet, regular exercise and sometimes medication can go a long way toward reducing high cholesterol”

(Mayo Clinic Health Manager, 2008, Definition section, para. 3).

<table>
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<tbody>
<tr>
<td>US white male</td>
<td>37%</td>
</tr>
<tr>
<td>MS white male</td>
<td>36%</td>
</tr>
<tr>
<td>MS black male</td>
<td>30%</td>
</tr>
<tr>
<td>US white female</td>
<td>34%</td>
</tr>
<tr>
<td>MS white female</td>
<td>37%</td>
</tr>
<tr>
<td>MS black female</td>
<td>32%</td>
</tr>
</tbody>
</table>

<table>
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<tbody>
<tr>
<td>US white male</td>
<td>74%</td>
</tr>
<tr>
<td>MS white male</td>
<td>72%</td>
</tr>
<tr>
<td>MS black male</td>
<td>64%</td>
</tr>
<tr>
<td>US white female</td>
<td>77%</td>
</tr>
<tr>
<td>MS white female</td>
<td>74%</td>
</tr>
<tr>
<td>MS black female</td>
<td>70%</td>
</tr>
</tbody>
</table>

Because we were not equal...

4% more white females in Mississippi...suffered from high blood cholesterol on average between 2001 and 2007.

NOTE: Blood pressure and cholesterol levels are self-reported measures obtained from the Behavioral Risk Factor Surveillance System, and thus are subject to the variations and errors associated with self-reported data.
White and black Mississippi males performed better with regards to blood cholesterol levels compared to whites across the nation. Black females in Mississippi also outperformed their white national counterparts.

However, white females in Mississippi suffered high blood cholesterol at higher levels than their national counterparts.

While African Americans are more likely to die of cardiovascular disease, they are less likely to see high levels of total blood cholesterol. Thus, total blood cholesterol is not as sensitive as an indicator of risk in this population (AMA, 2008).

**CHOLESTEROL SCREENING**

While Mississippians reported equal or better rates for high blood cholesterol, disparities in screening may result in under-reporting of high blood cholesterol. Overall, Mississippians are pursuing blood cholesterol screenings at rates slightly lower than the United States. From 2001 to 2007, 2% fewer Mississippians (with a rate of 71%) had their blood cholesterol checked at least once in the preceding 5 years compared to the United States (with a rate of 73%).

Compared to white males across the US (at 74%), **2% fewer white males in Mississippi** (at 72%) and **10% fewer black males in Mississippi** (at only 64%) achieved recommended blood cholesterol screening on average between 2001 and 2007. Compared to white females across the US (at 77%), **3% fewer white females in Mississippi** (at 74%) and **7% fewer black females** (at 70%) achieved recommended blood cholesterol screening.

In all groups, Mississippians saw lower rates of screening than their national counterparts. This brings the better performance of Mississippi males and black Mississippi females in cholesterol levels under question. Meanwhile, white females in Mississippi may be doing even worse than previously thought.
DIABETES

In persons afflicted with diabetes, the body does not produce or use insulin correctly, resulting in an inability for the cells of the body to uptake sugar from the bloodstream.

Diabetes falls into two categories, type 1 and type 2. Type 1 diabetes is typically diagnosed in childhood or young adulthood and arises from a lack of production of insulin. 5-10% of Americans with diabetes have type 1 diabetes. Type 2 diabetes, by far the most common, can result from a failure in insulin production or insulin-sensing by the cell (insulin resistance) (American Diabetes Association (ADA), n.d.).

Type 2 diabetes is typically diagnosed in adults over age 40; however, early onset of type 2 diabetes has been emerging in higher and higher numbers (AHA, 2010d). Diabetes increases risk for cardiovascular disease, nerve damage, kidney damage, eye damage, foot damage, skin and mouth infections, osteoporosis, Alzheimer’s disease, and hearing problems; 75% of diabetics die of heart or blood vessel disease (Mayo Clinic Health Manager, 2009b).

“In 2007, the direct ($116 billion) and indirect ($58 billion) cost attributable to diabetes was $174 billion” (AHA, 2010c).
DIABETES DIAGNOSIS

Mississippi, the Nation, and Healthy People 2010

Using the 1997 diagnosis rate of 40 per 1,000 or 4% as a baseline, Healthy People sets a goal of 25 diagnoses per 1,000, or 2.5%, for 2010. Unfortunately, from 2000 to 2007, the rate of diabetes diagnosis increased across the US (from 6% of the population to nearly 9%).

In Mississippi, the rate of diagnosis was higher overall and rose at a similar speed (from 8% to 11%). *With diabetes on the rise, both Mississippi and the nation are moving away from the Healthy People goal.*

Mississippians: How Have We Compared?

Among males in Mississippi, there appears to be minimal racial disparity with regards to diabetes diagnosis. From 2001 to 2007, 2% more white males in Mississippi (with a rate of 9%) had been diagnosed with diabetes compared to white males across the nation (with a rate of 6%). 3% more black males in Mississippi (with a rate of 10%) were diagnosed.

Nearly **1 in 3** diabetes diagnoses among **black males in Mississippi** and more than **1 in 5** diabetes diagnoses among **white males in Mississippi** would have been averted if we had achieved like our white national counterparts.
Similarly, white females in Mississippi saw rates 2% higher than white females across the nation (at 6%). **However, black females in Mississippi saw much higher rates of diagnosis.** From 2001 to 2007, an average of 8% more black females were diagnosed with diabetes (at a rate of 14%) compared to national whites.

Half of diabetes diagnoses among black females in Mississippi would have been averted if we achieved like the nation.

<table>
<thead>
<tr>
<th>Diabetes</th>
<th>Average 2000-2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>7%</td>
</tr>
<tr>
<td>MS white male</td>
<td>9%</td>
</tr>
<tr>
<td>MS black male</td>
<td>10%</td>
</tr>
<tr>
<td>US white female</td>
<td>7%</td>
</tr>
<tr>
<td>MS white female</td>
<td>8%</td>
</tr>
<tr>
<td>MS black female</td>
<td>14%</td>
</tr>
</tbody>
</table>

Because we were not equal...

- 1% more white females in Mississippi
- 2% more white males in Mississippi
- 3% more black males in Mississippi
- 7% more black females in Mississippi

... were diagnosed with diabetes from 2000-2007.
Diabetes can cause severe damage to the retina, resulting in blindness. Up to 45% of adults with diabetes suffer from some degree of diabetic retinopathy.

(Mayo Clinic Health Manager, 2009b).

Mississippi’s failures in preventative measures compared to the US put Mississippians at higher risk of diabetes complications and mortality.
The glycated hemoglobin test (A1C) provides an average estimate of an individual’s blood sugar levels over the past few months. (With an average of 66% of diabetics having received annual hemoglobin testing between 2002 and 2006) 8% fewer diabetic Mississippian received hemoglobin testing in comparison to the nation (which saw an average of 73%).

(With an average of 61% of diabetic Mississippian receiving annual vision screening over the 2000 to 2006 period) 8% fewer diabetic Mississippian were screened for retinal damage in comparison to the nation (which saw an average of 69%).

Mississippians saw the least disparity in foot checks. (With an average rate of 64% of diabetic Mississippian receiving annual foot checks over the 2000 to 2006 period) 2% fewer diabetic Mississippians were screened for foot complications compared to the US (which saw an average of 67%).

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Annual Hemoglobin Testing</td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>74%</td>
</tr>
<tr>
<td>MS</td>
<td>66%</td>
</tr>
<tr>
<td>Annual Vision Check</td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>68%</td>
</tr>
<tr>
<td>MS</td>
<td>63%</td>
</tr>
<tr>
<td>Annual Foot Check</td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>67%</td>
</tr>
<tr>
<td>MS</td>
<td>64%</td>
</tr>
</tbody>
</table>

Because we were not equal...

8% fewer Mississippian received annual hemoglobin testing
5% fewer Mississippian received annual vision checks
3% fewer Mississippian received annual foot checks

...on average between 2000 and 2006.

**END-STAGE RENAL DISEASE**

End-stage renal disease (ESRD), wherein the kidneys stop functioning normally, most commonly accompanies diabetes but is also commonly associated with high blood pressure. Cardiovascular disease is the leading cause of mortality among those who suffer from ESRD. Incidence of ESRD has increased by 40% over the last decade, and in 2005, ESRD cost the country $33 billion (AHA, 2009b). Black diabetics are more than twice as likely to experience ESRD (Carter, Pugh, and Monterrosa, 1996).
DIABETES MORTALITY

Diabetes mortality has become an increasing concern in recent years as rates of diabetes grow alongside the obesity epidemic.

Mississippi, the Nation, and Healthy People 2010

Using the 1997 US rate of 75 diabetes-related deaths per 100,000 as a baseline, Healthy People calls for a reduction in diabetes-related mortality to 45 deaths per 100,000 by 2010. This measure includes mortality with diabetes as a primary factor as well as with diabetes as a contributing factor. From 1997 to 2004, US rates held largely steady (76.2 diabetes-related deaths per 100,000 in 2004), while Mississippi rates rose (from 86.7 deaths per 100,000 to 98.4 per 100,000). Mississippi is moving away from the Healthy People target.

The disparity between Mississippi and the US in diabetes-related mortality more than doubled from 1999 to 2004.

In 2004, more than 1 in 5 diabetes-related deaths could have been averted if we had achieved like the nation.

As obesity and diabetes rates rise, with onset of diabetes among earlier and earlier age cohorts, the price of diabetes morbidity will rise. Diabetes mortality may rise not just as a result of rise in incidence of diabetes, but also as a reflection of reducing rates of cardiovascular disease mortality.
**Mississippians: How Have We Compared?**

Diabetes-related mortality disproportionately affects African Americans. Diabetes-related mortality for white males across the US held relatively steady (at 84.7 per 100,000 in 1999 and at 85.2 deaths per 100,000 in 2004). Early in this period, white MS male rates of mortality (at 85.2 per 100,000 in 1999) tracked closely with rates for white US males. However, rates among white males in Mississippi rose in the latter portion of the period (to 96.7 per 100,000 by 2004). Meanwhile, black males in Mississippi suffer from diabetes-related mortality at much greater rates, which are rising rapidly (from 122.7 per 100,000 to 147.8 per 100,000).

Higher rates of diabetes mortality among blacks and similar morbidity statistics point strongly to problems in access to care. End-stage renal disease, blindness (secondary to diabetes), and increased rates of amputation due to neuropathy are all more likely for a diabetic who is African American. Black diabetics are twice as likely to experience in-hospital mortality due to amputations (Carter, Pugh, and Monterrosa, 1996).
White females perform better than their male counterparts in diabetes-related mortality while black females perform worse than their male counterparts. As a result, there is a large and growing disparity in diabetes-related mortality between white US females and black MS females, which exceeds the disparity seen between their male counterparts.

Rates for white females in the US and MS remained fairly stable over the 1999 to 2004 period (mortality falling slightly from 61.4 per 100,000 to 59.1 per 100,000 for white US females and mortality rising slightly from 60.5 per 100,000 to 66.6 per 100,000 for white MS females). Meanwhile, diabetes-related mortality, already extremely high among black MS females rose (from 134.3 deaths per 100,000, to 152.1 per 100,000), more than double the rate for white US females.

More than 1 in 3 cases of diabetes-related mortality among black males would have been averted if they achieved like their white national counterparts.

Nearly 2 in 3 cases among black females in Mississippi would have been averted.
REFERENCES


ADDITIONAL AREAS OF DISPARITY

IN THIS SECTION:

SUICIDE

HIV

SYPHILIS

HEPATITIS

Hepatitis B Incidence and Vaccination
Hepatitis A Incidence
Hepatitis C Incidence

TUBERCULOSIS

UNINTENTIONAL INJURY

HOMICIDE
ADDITIONAL AREAS OF DISPARITY

SUICIDE

In 2006, suicide was the 11th leading cause of death in the United States (CDC, 2009). Men are 4 times more likely than women to die from suicide; however, 3 times more women than men report attempting suicide.

Suicide is most prevalent among young middle-aged and older adults. As additional risk factors include mental illness, physical illness, or abuse of drugs and alcohol. Suicide is best prevented by knowing the warning signs, which can include mood swings and changes in eating habits or sleeping patterns. Those contemplating suicide also may exhibit withdrawal, recklessness, and sudden loss of interest. “More people survive suicide attempts than actually die. They are often seriously injured and need medical care” (National Center for Injury Prevention and Control, 2009, para. 1).

“The cost of self-inflicted injuries (suicide and attempted suicide) is $33 billion annually ($32 billion in productivity losses, $1 billion in medical costs) (CDC, 2007, Costs of Violence section, para. 2). The average cost per case of suicide is $1 million lost productivity and $2,596 in medical costs. The average cost for a non-fatal self inflicted injury was $9,726 in lost productivity and $7,234 in medical costs” (CDC, 2007, Result of Violence Section, para. 3 & 4).

NOTE: All rates and resulting measures are age adjusted.
Mississippi, the Nation, and Healthy People 2010

Using the 1998 US rate of 11.3 suicides per 100,000 as a baseline, Healthy People 2010 calls for a reduction in suicides to 5 per 100,000 by 2010. As of 2005, the nation had not reached this goal, with a suicide rate of 11.1 per 100,000. If rates continue to follow current trends, it is unlikely that the US will achieve the Healthy People 2010 goal by 2010. Meanwhile, (with a 2005 rate of 12.8 per 100,000) Mississippi is actually moving away from the Healthy People goal.

Mississippians: How Have We Compared?

While the rates of suicide among white Mississippian have overtaken those among their national counterparts, rates for black Mississippian have remained well below national white averages. Since 1979, suicide rates among black females in Mississippi have been so low as to be unreliable. Rates among white females in Mississippi tracked closely with those of US females from 1979 (both 6.8 per 100,000) until the late 1980s when the rate for white females in Mississippi slightly overtook the national rate. By 2005, white females across the country (at 4.9 per 100,000) were 1.7 per 100,000 lower than among white females in Mississippi (at 6.6 per 100,000).

NOTE: In tables, red data represent a worsening in rate or percentage over the observed time period. Green data represent an improvement in rate or percentage.
Black males in Mississippi have consistently bettered their white counterparts. In 1979, the white U.S. male rate (20.7 per 100,000) was nearly triple the rate for black males in Mississippi (7.6 per 100,000). However, the advantage held by black MS males has reduced over time, from 13.1 per 100,000 fewer suicides in 1979 to 8.1 per 100,000 fewer in 2005 (when white US males saw a rate of 19.6 per 100,000 and black MS males saw a rate of 11.5).

Rates for white males in Mississippi (19.7 per 100,000 in 1979) were initially also lower than white national rates. However, since the early 1980s, white males in Mississippi have seen higher rates of suicide. In 2005, the rate for white males in Mississippi (27.4 per 100,000) exceeded the national rate (19.6 per 100,000) by 7.8 deaths per 100,000. In contrast to US rates, suicide rates are on the rise for all Mississippi males.

<table>
<thead>
<tr>
<th>Suicide (per 100,000)</th>
<th>1979</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>20.7</td>
<td>19.6</td>
</tr>
<tr>
<td>MS white male</td>
<td>19.7</td>
<td>27.4</td>
</tr>
<tr>
<td>MS black male</td>
<td>7.6</td>
<td>11.5</td>
</tr>
<tr>
<td>US white female</td>
<td>6.8</td>
<td>4.9</td>
</tr>
<tr>
<td>MS white female</td>
<td>6.8</td>
<td>6.6</td>
</tr>
</tbody>
</table>

Black males in Mississippi have held a large and consistent advantage over their white national counterparts. However, as rates of suicide fall for white males across the nation but increase for both black and white Mississippians, this advantage is decreasing.

Meanwhile, white males in Mississippi are seeing greater and greater disparities compared to their national counterparts.

Because we were not equal...

- 15 more white females in Mississippi
- 69 more white males in Mississippi
...committed suicide in 2005.

NOTE: Measurements of equality employ national white data as the standard for comparison.
**HIV**

The Human Immunodeficiency Virus (HIV) infects the body and weakens the immune system directly. HIV is transmitted through blood and sexual fluids.

Once contracted, the first symptoms of HIV may be non-existent, but it is common to develop flu-like symptoms within a few weeks of becoming infected. After this, symptoms may completely disappear for years. Later, as the infection progresses, HIV can cause weight loss, fever, and shortness of breath. The final stage of HIV is Acquired Immune Deficiency Syndrome (AIDS). The first reported case of AIDS in the US was in 1981 (CDC, 2009b).

**Mississippi, the Nation, and Healthy People 2010**

Using the 1998 US rate of 4.9 deaths per 100,000 as a baseline, Healthy People 2010 calls for a decrease in overall HIV mortality to 0.7 per 100,000 by 2010. As of 2005, the nation had not reached this goal, and the mortality rate had only declined to 4.4 per 100,000. **At the current rate of decline, it is unlikely the nation will achieve the Healthy People goal by 2010.**

Both the US and MS experienced a decline in HIV mortality in the mid-1990s. Until 1999, Mississippi rates were lower than national rates. However, Mississippi HIV mortality rates have overtaken national rates, and since then disparity between Mississippi and US HIV mortality rates has risen continuously. While the US is experiencing a gradual decline in HIV mortality, Mississippi is actually moving away from the Healthy People 2010 goal and is unlikely to meet the 2010 target.

“Since the beginning of the epidemic through 2006, an estimated 1,014,797 people have developed AIDS in the United States and dependent areas” (CDC, 2009, Acquired deficiency syndrome section, para. 1). The disease destroys the body’s ability to fight off infection, and therefore, “people who have AIDS are very susceptible to many life-threatening diseases, called opportunistic infections, and to certain types of cancer” (CDC, 2009, Acquired deficiency syndrome section, para.1).
**Mississippians: How Have We Compared?**

White males in Mississippi consistently better their national counterparts in HIV mortality. In 1987, 3.8 per 100,000 fewer white males in Mississippi (with a rate of 4.9 per 100,000) died of HIV infection compared to white US males (with a rate of 8.7 per 100,000). While this advantage has narrowed, white males in Mississippi in 2005 (at 2.6 per 100,000) still bettered their national counterparts (at 3.6 per 100,000).

Black males in Mississippi also initially bettered their white national counterparts. However, an incredibly steep rise in HIV mortality in the early ‘90s followed by a much smaller decline in mortality in the late ‘90s compared to white national male patterns left black males in Mississippi with wildly higher rates of HIV mortality compared to the nation (at 25.7 per 100,000 in 2005). In 2005, black males in Mississippi died of HIV infection at more than 7 times the white national rate. Unlike white males in Mississippi and across the US, HIV mortality for black males has shown no consistent decline in recent years.

<table>
<thead>
<tr>
<th>HIV Mortality (per 100,000)</th>
<th>1987</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>8.7</td>
<td>3.6</td>
</tr>
<tr>
<td>MS white male</td>
<td>4.9</td>
<td>2.6</td>
</tr>
<tr>
<td>MS black male</td>
<td>---</td>
<td>25.7</td>
</tr>
<tr>
<td>US white female</td>
<td>0.6</td>
<td>0.8</td>
</tr>
<tr>
<td>MS black female</td>
<td>---</td>
<td>9.3</td>
</tr>
</tbody>
</table>

1 in 5 black males in Mississippi would have avoided HIV mortality in 2005, if we achieved like our white national counterparts. HIV mortality among black MS females was more than 11 times the white national rate.

The 2007 adult HIV/AIDS diagnoses suggest that certain groups are at more risk than others. 74% of the diagnoses were male, and 26% were female. By race, blacks accounted for 51% of all HIV/AIDS diagnoses made during 2007. Whites comprised 29%, while Hispanics made up 18%. “In 2007, persons aged 40-49 accounted for the largest proportion of newly diagnosed HIV/AIDS cases (27%). Persons aged 30-39 were the second largest proportion (26%), followed closely by persons aged 20-29 (25%)” (CDC, 2009b).
Females die of HIV infection at much lower rates than their male counterparts. Rates among white females in Mississippi are so low as to be unreliable for study. In contrast, rates of HIV mortality among black females in Mississippi are on the rise, more than doubling from 1993 to 2005 (from 4.5 per 100,000 to 9.3 per 100,000).

Unlike trends seen for white Mississippians and whites across the nation, trends of HIV mortality for black males and females are still on the rise.

**RISK FACTORS FOR HIV:**

**AN EXAMINATION OF SUBSTANCE USERS IN THE MISSISSIPPI DELTA**

Substance users are more at risk to contract infectious diseases such as HIV because of their likelihood to participate in behaviors that place them at risk. These behaviors include: sharing needles and syringes, having multiple sexual partners, having sexual partners that are also substances users, and homelessness (Robertson, Herbert, & Leonard, 2008).

“In a study of 58 substance users at three regional community mental health centers in the Mississippi Delta, the majority reported cocaine use in the previous six months. Approximately 27% reported injection drug use. In addition several clients reported being homeless at some point in their life. Over one-fifth of the females and over 40% of males report a history of STD and approximately 4% of men and 6% of women assessed may be currently infected with an STD, based on symptoms reported. When we counted the number of HIV risk factors reported, we found that only 9 study participants or 15.5% reported zero risk factors. The average number of risk factors was three for males and 2.5 for females” (Robertson, Herbert, & Leonard, 2008, p. 1 & 2).

Substance users are also at greater risk to be infected with syphilis, tuberculosis, and hepatitis B and C than individuals who do not use alcohol or other drugs. Routine HIV testing is recommended to reduce transmission, however, in the Mississippi Delta, access to care is a serious obstacle (Robertson, Herbert, & Leonard, 2008).
SYPHILIS

PRIMARY & SECONDARY SYPHILIS

Syphilis is a sexually transmitted disease and is characterized by its ability to imitate symptoms of other diseases. In 2007, there were 40,920 cases reported in the United States (CDC, 2009c). If left untreated, the disease will progress, resulting in damage to internal organs, paralysis, and dementia. In rare cases, syphilis can be fatal. “As of 2007, syphilis was most prevalent in the age group of 25 to 29 year olds” (CDC, 2009c).

Mississippi, the Nation, and Healthy People 2010

Using the 1997 US rate of 3.2 cases per 100,000, Healthy People 2010 calls for a decrease of syphilis incidence to 0.2 cases per 100,000 by 2010. Unfortunately, US rates have actually risen slightly (to 4.5 per 100,000 in 2008), and the US is unlikely to meet the Healthy People goal.

Mississippi rates (at 14 per 100,000) were roughly four times the US rate in 1997 but dropped sharply in the first half of the decade, actually falling below US rates. Unfortunately, in recent years, rates of syphilis among Mississippians have begun to rise (to 6.3 per 100,000 in 2008). As of 2008, rates of syphilis in Mississippi had risen above US rates once more, and Mississippi is even less likely to meet the Healthy People goal.

<table>
<thead>
<tr>
<th>Syphilis Cases (per 100,000)</th>
<th>1997</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>3.2</td>
<td>4.5</td>
</tr>
<tr>
<td>MS</td>
<td>14.0</td>
<td>6.3</td>
</tr>
</tbody>
</table>

Source: CDC, n.d.c
HEPATITIS

HEPATITIS B INCIDENCE

Hepatitis B is a serious liver disease caused by the Hepatitis B virus (HBV). Those who are infected with HBV experience not only acute illness but chronic infection, cirrhosis of the liver, liver failure, and possible death. The disease is transmitted through puncture wounds or contact with infectious blood or body fluids. The Hepatitis B vaccine is the most effective measure in preventing disease. It is recommended for all infants as well as others at risk for infection (National Prevention Information Network (NPIN), 2008).

Nationally, the total reported number of Hepatitis B cases declined significantly from 1998 to 2006, from 10,258 to 4,713 cases reported (CDC, n.d.e). Since Mississippians represents 1% of the nation’s population, Mississippi should have seen a decline from 103 cases to 47 cases over this same period. Mississippi actually saw a drop from 94 cases to 13 cases between 1998 to 2006, creating a false impression that Mississippi is consistently seeing lower rates of Hepatitis B incidence than the nation. Unfortunately, while rates of Hepatitis B have decreased in Mississippi and were lower than national rates in 1998 and 2006, incidence was disproportionately large in comparison to national rates for all years from 1999 to 2005.

HEPATITIS B VACCINE

Hepatitis B vaccination rates are only available from BRFSS for 2006 and 2007. On average, from 2006 to 2007, US rates of Hepatitis B vaccination exceeded MS rates of vaccination by 4.8%.
HEPATITIS A INCIDENCE

Hepatitis A is a liver disease caused by the Hepatitis A virus (HAV). It is a self-limited disease that does not cause chronic infection or chronic liver disease. It is transmitted primarily through the oral-fecal route. It is also transmitted through person-person contact, as well as contamination of food or water. The HAV vaccine is the most effective measure in preventing the disease. The vaccine is recommended for all children at age 1 and international travelers (NPIN, 2008).

The nation experienced 23,229 new cases of Hepatitis A in 1998. However, US incidence of Hepatitis A declined rapidly, reaching 3,579 in 2006. Since Mississippian represents 1% of the nation’s population, Mississippi should have seen a decline from 232 to 36 cases over the same period. With the exception of one year, Mississippi has lower rates of Hepatitis A incidence than the nation over the observed time period. Cases of Hepatitis A in Mississippi have also declined overall, from 69 cases in 1998 to 9 cases in 2006.
HEPATITIS C INCIDENCE

Hepatitis C is a liver disease caused by the Hepatitis C virus (HCV). It may cause acute illness, but “most often becomes a silent, chronic infection that can lead to cirrhosis (scarring) of the liver, liver failure, liver cancer, and death” (NPIN, 2008). Most who have Hepatitis C never know they are infected until it is too late because they have no symptoms. The disease is spread by contact with infectious blood. To date there is no vaccine available for Hepatitis C.

From 1998 to 2006, Hepatitis C incidence declined overall across the US, from 3,518 cases to 766 new cases in 2006. Since Mississippian represents 1% of the nation’s population, Mississippi should have seen a decline from 35 to 8 cases over the same period.

At the beginning of the observed period, Mississippi saw much higher rates of Hepatitis C incidence than the nation, with 83 cases in 1998 and, at the peak, 304 cases in 2000. However, Hepatitis C incidence in Mississippi has declined in recent years. In 2006, with 4 cases, incidence was disproportionately low compared to prevalence across the nation.

“Hepatitis C is responsible for about one-third of all liver transplants in the United States. Approximately 1,000 patients are transplanted each year for liver disease due to hepatitis C. With the cost per liver transplantation in the range of $280,000 for one year, liver transplantation for hepatitis C alone reaches a cost of nearly $300 million per year. Moreover, the average lifetime cost for hepatitis C, in the absence of liver transplant, has been estimated to be about $100,000 for individual patients. Assuming that 80% of the 4.5 million Americans believed to be infected develop chronic liver disease, the total lifetime cost for this group (of 3.6 million) will be a staggering $360 billion in today’s dollars. Assuming an estimated survival of 40 years, the annual health care costs for the affected US population with chronic hepatitis C may be as high as $9 billion”

(The C. Everett Koop Institute, n.d., Associated Health Costs section, para. 2 & 3).
TUBERCULOSIS

Tuberculosis is a potentially serious infectious disease that primarily affects the lungs. It is passed from person to person through tiny droplets released into the air. Most people who become infected with the bacteria that cause tuberculosis do not develop symptoms of the disease (Mayo Clinic Health Manager, 2009).

Since tuberculosis is a disease of the lungs, infected individuals also experience coughing that lasts three or more weeks, coughing up blood, chest pain, and pain with breathing or coughing. Any individual can contract tuberculosis; however, those with weakened immunity or close contact with individuals who have the disease are more susceptible to tuberculosis. In the United States, the incidence of tuberculosis is eight times more likely to occur in foreign-born persons residing in the country rather than among US-born persons (NPIN, 2005).

In 1998, the US had 18,361 cases of tuberculosis reported. However, the US tuberculosis rate dropped steadily from 1998 through 2006, when it reached 13,779. Since Mississippian represent 1% of the nation’s population, Mississippi should have seen a decline from 184 to 138 cases over the same period.

At the beginning of the observed period, Mississippi saw higher rates of tuberculosis incidence than the nation, with 225 cases in 1998. However, tuberculosis incidence in Mississippi dropped more rapidly than across the nation, and in 2006, with 115 cases, incidence was disproportionately low compared to incidence across the nation.
In 2006, there were 27.7 million emergency department visits for unintentional injuries. Unintentional injury deaths include unintentional falls, motor vehicle traffic accidents, and unintentional poisoning (CDC, n.d.d).

**Mississippi, the Nation, and Healthy People 2010**

Using the 1998 rate of 35 deaths per 100,000 as a baseline, Healthy People 2010 calls for a drop in unintentional injury mortality to 17.5 per 100,000 by 2010. Based on current trends, neither the US nor MS is likely to meet the Healthy People 2010 goal; in fact, recent trends indicate both the US and MS are moving away from the Healthy People 2010 target.
While rates of unintentional injury mortality across the nation fell initially (from 46.5 per 100,000 in 1979 to 33.4 per 100,000 in 1992), these rates have since begun a slow increase (to 39.9 per 100,000 by 2005). Similarly, rates for Mississippi fell (from 68.2 per 100,000 in 1979 to 53.7 per 100,000 in 1995) but rose again in recent years (to 66.6 per 100,000 by 2005). Moreover, MS unintentional injury mortality rates are considerably higher than national rates.

**Mississippians: How Have We Compared?**

Since 1979, unintentional injury mortality rates for males in MS have been consistently higher than the rates of their white national counterparts. The white US male rate declined gradually (from 67.5 deaths per 100,000 in 1979 to a low of 47.1 deaths per 100,000 in 1992) before rising again in recent years (reaching 55.2 per 100,000 in 2005).

Rates for white MS males were much higher than national rates but followed a similar pattern, declining initially (from 100.4 per 100,000 in 1979) but rising again in the 1990s (reaching 96 deaths per 100,000 in 2005). Initially, black males in MS were the most likely to die of unintentional injury (at a rate of 133.5 per 100,000 in 1979). However, this rate has fallen drastically (reaching 91 deaths per 100,000 in 2005) without the increase in recent years seen by white males, and in 2005 the black MS male rate had fallen 5 per 100,000 below the rate for white MS males.

The unintentional injury mortality rates for females lie far below those for their male counterparts, but have experienced similar trends. The white US rate for females initially decreased slightly but rose again in recent years (creating a very slight overall rise from 25.6 deaths per 100,000 in 1979 to 25.8 per 100,000 in 2005).
Meanwhile rates for white females in Mississippi rose fairly steadily (from 30 deaths per 100,000 in 1979 to 46.1 per 100,000). Black females in Mississippi saw levels of unintentional injury mortality similar to white MS females, but their rates were slightly more variable, fluctuating around white MS female rates over the observed period (at 35.1 per 100,000 in 1979 and 35.6 per 100,000 in 2005).

<table>
<thead>
<tr>
<th>Unintentional Injury Mortality (per 100,000)</th>
<th>1979</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>67.5</td>
<td>55.2</td>
</tr>
<tr>
<td>MS white male</td>
<td>100.4</td>
<td>96</td>
</tr>
<tr>
<td>MS black male</td>
<td>133.5</td>
<td>91</td>
</tr>
<tr>
<td>US white female</td>
<td>25.6</td>
<td>25.8</td>
</tr>
<tr>
<td>MS white female</td>
<td>30</td>
<td>46.1</td>
</tr>
<tr>
<td>MS black female</td>
<td>35.1</td>
<td>35.6</td>
</tr>
</tbody>
</table>

Because we were not equal...

- 56 more black females in Mississippi
- 182 more black males in Mississippi
- 185 more white females in Mississippi
- 360 more white males in Mississippi
- ...died of unintentional injury in 2005.

“...the total economic cost of motor vehicle crashes in 2000 was $230.6 billion. This represents the present value of lifetime costs for 41,821 fatalities, 5.3 million non-fatal injuries, and 28 million damaged vehicles, in both police-reported and unreported crashes. Lost market productivity accounted for $61 billion of this total, while property damage accounted for nearly as much - $59 billion. Medical expenses totaled $32.6 billion and travel delay accounted for $25.6 billion. Each fatality resulted in an average discounted lifetime cost of $977,000. Public revenues paid for roughly 9 percent of all motor vehicle crash costs, costing tax payers $21 billion in 2000, the equivalent of over $200 in added taxes for every household in the U.S.” (U.S. Department of Transportation, 2000, p. 8).
HOMICIDES

Mississippi, the Nation, and Healthy People 2010

Using the 1998 US rate of 6.5 homicides per 100,000 as a baseline, Healthy People 2010 calls for a drop in homicides to 3.0 per 100,000 by 2010. The US homicide rate rose in the late 1980s, but has steadily declined since the mid 1990s (reaching a rate of 6.3 per 100,000 in 2005). If the current trend continues, the US could reach the Healthy People 2010 target by 2010. MS homicide rates follow US patterns but are consistently higher (at 8.9 per 100,000 in 2005); Mississippi rates of homicide will near the healthy people target by 2010 if current trends continue.

Mississippians: How Have We Compared?

Homicide rates for white males in MS tracked closely with those of their national counterparts from 1979 to 2005, both rates declining gradually (from 9.5 per 100,000 to 5.4 per 100,000 for white US males, and from 11.1 per 100,000 to 7.1 per 100,000 for white MS males). Rates for black MS males were much greater.

In 1979, the rate of homicide among black males in Mississippi (at 60.8 per 100,000) was more than six times greater than the white US rate and more than 5
times greater than the white MS rates. After declining in the 1980s, the black MS male homicide rate rose again in the mid 1990s. Since that time, however, rates have dropped rapidly. While the 2005 rate of homicide for black males in Mississippi (23.8 per 100,000) remains significantly higher than white rates, **homicide rates for black MS males are dropping much more rapidly than rates for white males.** Between 1979 and 2005, excess deaths among black MS males compared to white US males dropped from 51.3 per 100,000 to 18.4 per 100,000.

**Homicide rates among white females in MS has also tracked very closely to that of their national counterparts.** Rates for both groups changed very little from 1979 until 2005 (rates for white US females dropping from 2.9 per 100,000 to 1.9 per 100,000, and rates for white MS females - unreliable in 1979 - dropping from 4 per 100,000 in 1980 to 2.7 per 100,000 in 2005).

Homicide rates for black females in the state were higher than white rates (at 12.6 per 100,000 in 1979 and 8 per 100,000 in 2005). Moreover, disparity between black MS females and white US females is not decreasing quite as rapidly as among their male counterparts, only dropping from 9.7 per 100,000 to 6.1 per 100,000 over the observed period.

**Table:**

<table>
<thead>
<tr>
<th>Homicide (per 100,000)</th>
<th>1979</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>9.5</td>
<td>5.4</td>
</tr>
<tr>
<td>MS white male</td>
<td>11.1</td>
<td>7.1</td>
</tr>
<tr>
<td>MS black male</td>
<td>60.8</td>
<td>23.8</td>
</tr>
<tr>
<td>US white female</td>
<td>2.9</td>
<td>1.9</td>
</tr>
<tr>
<td>MS white female</td>
<td>---</td>
<td>2.7</td>
</tr>
<tr>
<td>MS black female</td>
<td>12.6</td>
<td>8.0</td>
</tr>
</tbody>
</table>

**Source:** CDC, Compressed Mortality Data, n.d.a; n.d.b

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**Because we were not equal...**

- 7 more white females in Mississippi
- 15 more white males in Mississippi
- 35 more black females in Mississippi
- 93 more black males in Mississippi

...were victims of homicide 2005.
“Americans suffer 16,800 homicides and 2.2 million medically treated injuries due to interpersonal violence annually, at a cost of $37 billion ($33 billion in productivity losses, $4 billion in medical treatment). The average cost per homicide was $1.3 million in lost productivity and $4,906 in medical costs. The average cost per case for a non-fatal assault resulting in hospitalization was $57,209 in lost productivity and $24,353 in medical costs” (CDC, 2007, Costs of Violence section, para. 1).


ADDITIONAL AREAS OF DISPARITY
ACCESS TO CARE

AUTHORS: Lindsay Jones, M.S.; Sangeetha Shivaji, M.S.; Arthur G. Cosby, Ph.D., Elliott Welford

IN THIS SECTION:

VACCINATION: A MEASURE OF ACCESS TO PREVENTATIVE CARE
Adult Immunization
Pneumonia Mortality

AVAILABILITY OF CARE
Insurance
Usual Primary Care Provider
Economic and Resource Limitations in Access to Care
“Access to care is important for prevention, for prompt and continuing treatment of illness and injury, and to avoid possible hospitalization” (CDC, 2008, Access to care section, para. 1).

Access to Care refers to the relative ease with which an individual or group can attain adequate healthcare. Access typically comprises not only the availability of health resources but also economic constraints. Disparities in access to care arise between rural and urban areas as well as among minority populations. Here we look at several indicators of access to care, including levels of vaccination, insurance coverage, and utilization of primary care providers. We will also touch on affordability of health care, problems of transportation, and availability of medical professionals.
VACCINATION: A Measure of Access to Preventative Care

ADULT IMMUNIZATION

Because elderly patients are at greater risk for adverse effects from influenza and pneumonia, immunizations for persons over the age of 65 are crucial (CDC, 2010). Immunization levels thus serve as an important indicator of the care available to older populations.

Mississippi, the Nation, and Healthy People 2010

Using the 1998 baseline of 64% of adults 65 and older receiving a yearly influenza vaccination and 46% receiving a pneumococcal vaccine, Healthy People calls for an increase in the proportion of adults 65 and older who receive these vaccines to 90% (U.S. Department of Health and Human Services (DHHS), n.d.).

From 2001 to 2007, an average of 61.7% of elderly Americans received an annual flu vaccination compared to 62.6% of elderly Mississippians. By 2007, 70% of elderly Americans received an annual flu vaccination, and Mississippians only trailed the US by 0.6%. While the nation and Mississippi are moving forward, current trends may not be sufficient for them to achieve the Healthy People goal by 2010 (DHHS, n.d.).

Influenza is an acute viral infection that spreads easily from person to person, causing annual epidemics that peak during the winter of temperate regions. Symptoms include high fever, muscle and joint ache, cough, and sore throat. Flu affects all age groups, but children younger than two years of age and people 65 or older have the highest risk of complications from the flu, such as severe illness or even death (World Health Organization (WHO), 2009).
Over the same period, an average of 61% of elderly Americans and 61.1% Mississippians received pneumococcal vaccinations. By 2007, 63.1% of elderly Americans and 62.5% of elderly Mississippians were immunized against pneumonia. Given current trends, neither Mississippi nor the nation is likely to achieve the Healthy People pneumococcal vaccination target.

Pneumonia is an inflammation of the lungs that can be caused by bacteria, viruses, fungi, or parasites. Pneumonia is known for its ability to mimic other viruses, especially the flu. Common symptoms are “fever, cough, shortness of breath, sweating, fatigue, and chest pain that fluctuates with breathing” (Mayo Clinic Manager, 2009, Symptoms section, para. 2). Pneumonia’s severity ranges from mild to life-threatening; it is especially dangerous to individuals over age 65 and those suffering from chronic illnesses or weakened immune systems (Mayo Clinic Manager, 2009).

In 2007, the US and Mississippi fell short of the Healthy People annual flu vaccination goal by 20% and 21%, respectively, while both fell short of the pneumococcal goal by 27%.
Blacks are significantly disadvantaged when it comes to immunization for flu and pneumonia. From 2001 to 2007, white males across the US over the age of 65 and white males in MS achieved similar average rates of flu vaccination (65.0% and 65.3%, respectively). Over this same period, 18.9% fewer elderly black males in MS were vaccinated (46.4%).

Similarly, elderly white males in MS achieved an average rate of pneumococcal vaccination 3.6% higher (at 65.8%) than the national rate (62.2%), while an average of 23.3% fewer black males in Mississippi (with a rate of 38.9%) were vaccinated.

“Between 5 and 10 million people get pneumonia in the United States each year, and more than 1 million people are hospitalized due to the condition. As a result, pneumonia is the fourth most frequent cause of hospitalizations”

(University of Maryland Medical Center, 2009, Prognosis section, para. 1).
Elderly females achieved immunization in patterns like those of their male counterparts. From 2001 to 2007, white elderly females in Mississippi received flu vaccination at slightly higher rates (65.7%) than their national counterparts (64.0%). Like their male counterparts, black females in Mississippi (with an average of only 45.6%) received vaccination at much lower rates; 18.4% more black elderly females in Mississippi would have received flu vaccination if we achieved at white national levels.

Similarly, while an average of 67% of white elderly females across the nation and 69.9% of white elderly females in Mississippi received pneumococcal vaccination, black elderly females in Mississippi (with a rate of 40.3%) trailed by 26.7%.

<table>
<thead>
<tr>
<th>Flu Vaccination (over 65 years old)</th>
<th>Average 2001-07</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white female</td>
<td>64.0%</td>
<td>72.6%</td>
</tr>
<tr>
<td>MS white female</td>
<td>65.7%</td>
<td>73.5%</td>
</tr>
<tr>
<td>MS black female</td>
<td>45.6%</td>
<td>57.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pneumonia Vaccine (over 65 years old)</th>
<th>Average 2001-07</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white female</td>
<td>67.0%</td>
<td>69.7%</td>
</tr>
<tr>
<td>MS white female</td>
<td>69.9%</td>
<td>73.0%</td>
</tr>
<tr>
<td>MS black female</td>
<td>40.3%</td>
<td>49.4%</td>
</tr>
</tbody>
</table>

Because we were not equal...

- 15% fewer black females in Mississippi
- 18% fewer black males in Mississippi
- ...65 and older received annual flu vaccinations in 2007.

Because we were not equal...

- 21% fewer black females in Mississippi
- 34% fewer black males in Mississippi
- ...65 and older had ever received a pneumonia vaccination in 2007.
PNEUMONIA MORTALITY

Mortality due to influenza is uncommon for both the United States and Mississippi; therefore recorded rates of influenza mortality in Mississippi are too low to be reliable for study. Pneumonia mortality, on the other hand, is far more common. While pneumonia responds well to treatment, the infection still takes the life of roughly 40,000 to 70,000 people every year (University of Maryland Medical Center, 2009).

Mississippi, the Nation, and Healthy People 2010

Pneumonia mortality is declining for the nation as well as for Mississippi. From 1999 to 2004, rates of pneumonia morality declined across the US (84.7 per 100,000 deaths to 68 per 100,000 deaths). However, Mississippi rates are consistently higher than national pneumonia mortality rates (falling from 91.2 per 100,000 in 1999 to 75 per 100,000 in 2004).

Mississippians: How Have We Compared?

Pneumonia deaths among white males across the nation decreased from 1999 to 2004 (107.2 deaths per 100,000 to 84.3 per 100,000). Although rates among white and black males in Mississippi also dropped (119.9 to 101.3 deaths per 100,000 for white males and 132.3 per to 102.5 per 100,000), pneumonia rates for males in Mississippi remain much higher than rates for their white national counterparts. In 2004, 17 more white males per 100,000 and 18.2 more black males per 100,000 would have survived if Mississippi experienced pneumonia mortality at national levels.
Pneumonia deaths among white females dropped from 1999 to 2004 (68.8 per 100,000 to 56.1 per 100,000). Although rates among white females in Mississippi spiked in 2002, the rate dropped to near-national rates by 2004 (from 75.1 in 1999 to 58.4 per 100,000). Similarly, rates among black females experienced an increase in 2002, but decreased overall from 1999 to 2004 (67 to 58.5 per 100,000). 2.3 more white females per 100,000 and 2.4 more black females per 100,000 would have survived in Mississippi if we experienced pneumonia mortality at national levels.

<table>
<thead>
<tr>
<th>Pneumonia Mortality (per 100,000)</th>
<th>1999</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>107.2</td>
<td>84.3</td>
</tr>
<tr>
<td>MS white male</td>
<td>119.9</td>
<td>101.3</td>
</tr>
<tr>
<td>MS black male</td>
<td>132.3</td>
<td>102.5</td>
</tr>
<tr>
<td>US white female</td>
<td>68.8</td>
<td>56.1</td>
</tr>
<tr>
<td>MS white female</td>
<td>75.1</td>
<td>58.4</td>
</tr>
<tr>
<td>MS black female</td>
<td>67</td>
<td>58.5</td>
</tr>
</tbody>
</table>

Because we were not equal...

- 14 more black females in Mississippi
- 21 more white females in Mississippi
- 92 more black males in Mississippi
- 150 more white males in Mississippi

...died of pneumonia in 2004.

Source: CDC Compressed Mortality Data, n.d.

The G.V. Sonny Montgomery VA Medical Center seeks to serve the needs of America’s veterans by providing primary care, specialized care, and related medical and social support services.

(Provided by Emily Nations, 2010.)
“Health insurance coverage is an important determinant of access to health care. Uninsured children and non-elderly adults are substantially less likely to have a usual source of health care or a recent health care visit than their insured counterparts.”

(CDC, 2008, Health insurance and access to care section, para. 1).

**Mississippi, the Nation, and Healthy People 2010**

Using the 1997 rate of 83% of Americans (under the age of 65) with health insurance, Healthy People calls for universal health coverage for individuals under the age of 65 by 2010. From 2000 to 2007, an average of only 81.9% of the nation had health coverage.

An average of 76.2% of Mississippians received coverage over the same period. On average, from 2000 to 2007, 6% more Mississippians would have received health coverage if we achieved at the national level. Neither Mississippi nor the US is approaching the HP2010 target of universal health coverage.

“The major source of coverage for persons under 65 years of age is private employer-sponsored group health insurance. Private health insurance may also be purchased on an individual basis, but it costs more and generally provides less coverage than group insurance. Public programs such as Medicaid and the State Children’s Health Insurance Program provide coverage for many low-income children and adults” (CDC, 2008, Health insurance and access to care section, para. 1).
Mississippians: How Have We Compared?

Black Mississippi males are furthest behind in health coverage. From 2000 to 2007, an average of 85.7% of white males across the US and 81% of white males in Mississippi had health insurance. Meanwhile, average coverage among black males in Mississippi was 66.4%. On average, from 2000 to 2007, 5% more white males and 19% more black males in Mississippi would have received health coverage if we achieved at white national levels.

Black females in Mississippi fare only slightly better than their male counterparts in health coverage. From 2000 to 2007, an average of 87.8% of white females across the US had health coverage. Meanwhile, average coverage among white females in Mississippi was 80.1%, and average coverage among black females in Mississippi was 71.7%. On average from 2000 to 2007, 8% more white females and 16% more black females in Mississippi would have received health coverage if we achieved at white national levels.

### Health Coverage (under 65)

<table>
<thead>
<tr>
<th></th>
<th>Average 2000-07</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>85.7%</td>
<td>85.8%</td>
</tr>
<tr>
<td>MS white male</td>
<td>81.0%</td>
<td>82.3%</td>
</tr>
<tr>
<td>MS black male</td>
<td>66.4%</td>
<td>68.6%</td>
</tr>
<tr>
<td>US white female</td>
<td>87.8%</td>
<td>88.1%</td>
</tr>
<tr>
<td>MS white female</td>
<td>80.1%</td>
<td>81.2%</td>
</tr>
<tr>
<td>MS black female</td>
<td>71.7%</td>
<td>71.5%</td>
</tr>
</tbody>
</table>
Health insurance coverage falls under two categories, private or government. Private coverage is purchased from a private company by an individual, an employer, or a union. Programs such as military health care, Medicare, and Medicaid typify government healthcare coverage. A major obstacle to obtaining health care coverage is its high cost. At higher incomes, lower proportions of people lack health insurance. In 2007, among households with annual incomes of less than $25,000, 24.5% of people had no health insurance, and among households with incomes of $25,000 to $49,999, the rate was 21.1%. Among households with incomes of $50,000 to $74,999, the rate dropped even further to 14.5%, and among households with incomes of $75,000 or more, only 7.8 percent were uninsured (DeNavas-Walt, Proctor, & Smith, 2008).

On average from 2000 to 2007, white US females and black MS females received health coverage at higher rates than their male counterparts. In contrast, white females in Mississippi received health coverage at slightly lower rates than white MS males.

<table>
<thead>
<tr>
<th>Because we were not equal...</th>
</tr>
</thead>
<tbody>
<tr>
<td>4% fewer white males in Mississippi</td>
</tr>
<tr>
<td>7% fewer white females in Mississippi</td>
</tr>
<tr>
<td>16% fewer black females in Mississippi</td>
</tr>
<tr>
<td>17% fewer black males in Mississippi</td>
</tr>
<tr>
<td>...under 65 had health coverage in 2007.</td>
</tr>
</tbody>
</table>

USUAL PRIMARY CARE PROVIDER

Mississippi, the Nation, and Healthy People 2010

Primary care providers can monitor health progress in patients and ensure proper, long-term health management. Healthy People calls for 85% of the population to have a usual primary care provider by 2010 — an 8% increase from the 1996 baseline of 77%. From 2001 to 2007, an average of 79.3% of people in the US had a usual primary care provider compared to an average of 76.8% of Mississippians. Neither Mississippi nor the nation is likely to meet the Healthy People goal by 2010.
**Mississippians: How Have We Compared?**

Black males in Mississippi are the least likely to have a primary care provider. From 2001 to 2007, an average of 78.8% of white males across the US had a usual primary care provider compared to only 73.9% of white males and 63.3% of black males in Mississippi. **5% more white males and 16% more black males in Mississippi would have had a usual source of care if we achieved at white national levels.**

Females are much more likely to have a usual source of primary care, but black females in Mississippi, like their male counterparts, are the least advantaged. On average, 88.4% of white females across the US have a usual primary care provider, compared to 85.7% of white females and 80.7% of black females in Mississippi. **3% more white females and 8% more black females in Mississippi would have had a usual source of care if we achieved at white national levels.**

“People who lack a usual source of care or who change their usual source of care are more likely to have unmet health care needs than people with a continuous usual source of care”

(Costello, Cossman, Ritchie, & Breen, 2006, Medical Homes and Quality of Care section, para. 3).

<table>
<thead>
<tr>
<th>Usual Primary Care Provider</th>
<th>Average 2001-07</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>US white male</td>
<td>78.8%</td>
<td>79.8%</td>
</tr>
<tr>
<td>MS white male</td>
<td>73.9%</td>
<td>74.8%</td>
</tr>
<tr>
<td>MS black male</td>
<td>63.3%</td>
<td>62.5%</td>
</tr>
<tr>
<td>US white female</td>
<td>88.4%</td>
<td>88.6%</td>
</tr>
<tr>
<td>MS white female</td>
<td>85.7%</td>
<td>87.3%</td>
</tr>
<tr>
<td>MS black female</td>
<td>80.7%</td>
<td>80.5%</td>
</tr>
</tbody>
</table>
AVAILABILITY OF CARE

There are distinct disparities between whites and blacks in access to care, with major racial differences arising in vaccination levels, health coverage, and access to primary care providers. Gender differences also come into play in a major way with regards to pneumonia mortality and access to primary care providers. These race and gender disparities are even more perceptible when access to care is examined more intensively.

Because we were not equal...

<table>
<thead>
<tr>
<th>Percentage Difference</th>
<th>Mississippi Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2% fewer white females</td>
<td>5% fewer white males</td>
</tr>
<tr>
<td>8% fewer black females</td>
<td>17% fewer black males</td>
</tr>
</tbody>
</table>

...had a usual primary care provider in 2007.

MISSISSIPPI MEDICAID MEDICAL HOME

“The [Mississippi Medicaid Medical Home] legislation, passed into law in 2004 for implementation starting in 2005, has two main components: provision of an annual physical examination for all Medicaid enrollees and encouraging enrollees to identify a usual source of care for their primary health care needs. Although not a component of MMMH, the legislation also requires annual face-to-face eligibility interviews for Medicaid enrollees. At the eligibility interview, Medicaid enrollees will have the MMMH program and its functions explained to them. (Costello, Cossman, Ritchie, & Breen, 2006, Medical homes - a Review of the Concept section, para. 1)

“The basic idea of MMMH is that although it may cost the state more money upfront, preventive services, continuity of care, and avoiding hospitalization and emergency department (ED) use will eventually save money. Regularly scheduled periodic examinations should encourage participants to rely on a usual source of care, encouraging better use of preventive services and greater continuity of care, thereby reducing avoidable ED use and hospitalizations. Periodic examinations should reduce hospital and ED costs both through enrollees’ better health – once conditions identified during initial physical exams are addressed – and because enrollees will get appropriate services at the doctor’s office or clinic, not the hospital” (Costello, Cossman, Ritchie, & Breen, 2006, Medical homes - a Review of the Concept section, para. 3).
“Narrowly defined, access to health care is a question of whether there is sufficient supply of providers to match patient demand. More broadly, access encompasses availability (whether patients can physically reach care), appropriateness (whether patients receive the appropriate level of care), preference (whether patients can get medical services from the recommended provider) and timeliness (avoiding substantial waiting periods for appointments)”

(Costello, Cossman, Ritchie, & Breen, 2006, The Mississippi Medicaid Medical Home: Concept and Baseline Data section, para. 5).

ECONOMIC & RESOURCE LIMITATIONS IN ACCESS TO CARE

Access to health care is affected by a multitude of factors, such as availability and affordability of health insurance, affordability of health care, availability of transportation, and availability of local physicians. The Mississippi Health Survey (MHS) includes measures for many of these important factors. However, since this is a state-wide survey, comparable national data is not always available.
With Mississippi falling behind the nation in health coverage, the affordability of health care weighs more heavily on Mississippians. In 2007, the Behavioral Risk Factor Surveillance System (BRFSS) found that 8.8% of white males across the US did not pursue medical care because of cost. In contrast, only a year later, the MHS found that 13% of white males and 23.8% of black males in Mississippi had not seen a doctor because of cost.

Women are even more likely to avoid health care because of cost. In 2007, 12% of white females across the US did not pursue care because of cost. Meanwhile, in Mississippi in 2008, 19.1% of white females and 28.3% of black females did not see a doctor when they needed to because of cost.

Similar patterns emerge with access to dental care. In 2008, 20.8% of white men and 27.6% of black men in Mississippi had foregone dental treatment because of cost. Females were even less likely to pursue treatment; 24.5% of white females and about 32.8% of black females in Mississippi did not pursue dental treatment due to cost.

Mississippians also forgo mental health care due to cost. In 2008, 10.2% of black females and 8.6% of white females did not pursue mental health care because of cost.

Males were again more likely to have the resources for such care with only 6.8% of white males and 6.2% of black males in Mississippi forgoing treatment. Because mental health care is a lesser known field, patients may be less likely to identify their problems as mental health care needs.
Black females in Mississippi are not only the most likely to forgo health care, dental care, and mental health care due to cost – they are also most likely to owe a provider for prior services. In 2008, 51% of black females in Mississippi owed a hospital or other medical facility money for services or care compared to 40.4% of white females. Males in Mississippi are less likely to owe money, with 34% of black males and 24.6% of white males reporting owing a provider.

Black females in Mississippi, at 46.1%, are also most likely to have had their medical debts turned over for collection compared to white females, at 28%. Black males, at 30.1%, are also particularly high risk for medical debts turned over for collection.

Interestingly, while compared to black MS males, 6.4% more white females in Mississippi owed money for health services or care in 2008, 2.1% more black MS males had medical debts turned over for collection, compared to white MS females.

White males are least likely to have their medical debt turned over for collection at 21.4%. Black patients are also disproportionately more likely to have their wages garnished with 6.4% of black patients having had their wages garnished to pay for medical services compared to 1-2% of white patients.

<table>
<thead>
<tr>
<th></th>
<th>White Male</th>
<th>Black Male</th>
<th>White Female</th>
<th>Black Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owed hospital or other medical facility</td>
<td>24.6%</td>
<td>34.0%</td>
<td>40.4%</td>
<td>51.0%</td>
</tr>
<tr>
<td>Medical debts turned over for collection</td>
<td>21.4%</td>
<td>30.1%</td>
<td>28.0%</td>
<td>46.1%</td>
</tr>
<tr>
<td>Wages garnished to pay for medical services</td>
<td>0.8%</td>
<td>6.4%</td>
<td>1.9%</td>
<td>5.5%</td>
</tr>
</tbody>
</table>

Black females in Mississippi are not only the most likely to forgo health care, dental care, and mental health care due to cost – they are also most likely to owe a provider for prior services and have their medical debts turned over for collection.

1 in every 2 black females in Mississippi owed a hospital or other medical facility money for services or care in 2008, as did 2 in every 5 white females in Mississippi.
1 in every 3 black males in Mississippi owed a hospital or other medical facility money for services or care in 2008, as did 1 in every 4 white males in Mississippi.

While black males in Mississippi are least likely to have health coverage and a primary care provider, black females are most likely to forgo medical care, dental care, and mental health care due to cost.

Moreover, black females in Mississippi are most likely to owe money for medical services and have medical debts turned over for collection (nearly 1 in 2).

“One of the primary factors influencing access is physician reimbursement. For Medicaid patients, some research has shown that higher reimbursement rates lead to higher physician participation, more office visits among adults and no change in children’s rate of office visits. On the other hand, others have claimed that fee changes do not influence physician participation, which calls into question their impact on access to care. Nonetheless, with Medicaid payments increasing at a rate slower than inflation (as a national average) through most of the 1990s and falling relative to Medicare payments, there has been a rising concern that physicians will be less willing to accept new Medicaid patients. It is unclear whether payment for annual physicals through the MMMH program will provide an incentive for providers to treat Medicaid patient”

(Costello, Cossman, Ritchie, & Breen, 2006, The Mississippi Medicaid Medical Home: Concept and Baseline Data section, para. 6).
“Mississippi physicians are not evenly distributed relative to the population, which produces gaps in access to physician care. More than half (56%) of all Mississippi physicians are located in four urban areas, leaving 51 of 82 counties underserved. Only 12% of the state’s doctors are located in the Mississippi Delta”

(Cossman, 2003, The Findings Section, para. 2).

“Nationally, there are three doctors to every 1,000 residents; however, in Mississippi, there are only two doctors to every 1,000 residents”

(Cossman, 2003, The Findings Section, para. 1).
In 2008, more than 1 in every 10 black Mississippians did not seek medical attention because of lack of transportation.

<table>
<thead>
<tr>
<th></th>
<th>White Male</th>
<th>Black Male</th>
<th>White Female</th>
<th>Black Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>No treatment pursued due to transportation issues</td>
<td>2.1%</td>
<td>12.9%</td>
<td>2.7%</td>
<td>12.6%</td>
</tr>
<tr>
<td>No treatment pursued due to distance to physician</td>
<td>2.9%</td>
<td>7.3%</td>
<td>4.1%</td>
<td>7.7%</td>
</tr>
</tbody>
</table>

Indirect costs can also play a large role in the decision to pursue medical care. Access to adequate transportation is one example. In Mississippi in 2008, 12.9% of black males and 12.6% of black females did not pursue medical treatment because they lacked access to transportation. In contrast, 2.1% of white males and 2.7% of white females in Mississippi forwent treatment because of lack of transportation. Black patients in Mississippi are also disproportionately affected by the distance to a physician. 7 to 8% of black patients reported being too far from a provider to pursue care compared to only 3-4% of white patients.

"Nationally, rural Americans represent 20 percent of the population, but only 11 percent of physicians are located in rural areas. The rural physician supply is already a problem and projections indicate that the problem may get worse. While the physician workforce grew nationally by nearly 25 percent from 1990 through 1997, in rural areas the physician workforce grew only by 11 percent. Rural areas started the 1990s with a physician shortage and this disadvantage increased through most of the decade" (Cossman, Ritchie, & Breen, 2006, The Mississippi Medicaid Medical Home: Concept and Baseline Data section, para. 7).
REFERENCES


FORECASTING THE FUTURE

AUTHOR: Arthur G. Cosby, Ph.D.

CLOSING REMARKS:

A MISSISSIPPI WITHOUT HEALTH DISPARITIES

Positioning for the Future
Health and Wealth
What If We Stay Unequal?
The future of Mississippi depends in no small part on the elimination of health disparities.

In the first chapter of this volume we state that health disparities in the U.S. are largely based on disadvantages of social class, race, ethnicity, and geography (Barr, 2008). The intersections of these disadvantages produce truly powerful consequences. In Mississippi, individuals and communities often endure not just one but multiple disadvantages, creating an environment of hyper-disparity. Groups with lower socioeconomic status, African-American heritage, and rural residence all experience significant disparity, and these groups represent huge and overlapping segments of the Mississippi population, resulting in truly profound impacts on the health status of the state. In this section, we will imagine a Mississippi without health disparities, a Mississippi whose health is equivalent to that of mainstream America. What could such changes mean for Mississippi?
Before engaging in a forecasting of the future, it is useful to consider some forces informing the origins of health disparities in Mississippi. Although many discussions of health disparities focus on factors such as social class, race/ethnicity, and residence, powerful historical and cultural influences are also at play. The history and culture of the African-American experience in the U.S., and in particular the state of Mississippi, should not be ignored.

Let us begin with an analogy. Malcolm Gladwell, in his best seller *Outliers*, offers an intriguing discussion of the extraordinary success of Jewish immigrants in America. He asks, why are there so many Jewish doctors, lawyers, and professors, given their relatively small population base? His answer: Jewish history, culture, and the timing of Jewish immigration to America. Historically, many Eastern European Jews experienced discrimination, one manifestation being denial of the privilege of land ownership. Because of this discrimination, many turned to such vocations as owning and operating clothing and furrier enterprises in Eastern European cities. These occupations required complex organizational and business skills, including planning, marketing, finance, and management. When European Jews migrated to the U.S. at the turn of the century, many entering and settling in New York City, these skills differentiated the Jewish immigrants from the majority of immigrants who were largely versed in agriculture and manual labor. More importantly, these skills positioned them perfectly for success in garment and textile industries exploding in that time and place in the U.S. Working diligently, in the right place, at the right time, the Eastern European Jews had all the tools to take advantage of a growing economy. The initial successes of these immigrants produced a wave of successful Jewish immigrant enterprises throughout New York, and it should be of little surprise that the thus-advantaged second and third generations of these immigrants found their way into the privileged professions of medicine, law, and education.

The timing, the location, and the skills of Eastern European Jews entering the U.S. was superb. By comparison, the timing, the location, and the circumstances of Africans migrating to Mississippi could hardly have been more horrendous. The African slaves who arrived in Mississippi were clearly at the wrong place at the wrong time with the wrong skills (and opportunities) to take advantage of the New World prospects. African slaves were captured, sold into slavery, and forced to come to the plantation South. For the most part, the slave role was to provide manual labor as field hands for the agrarian economy of the South. Their days were spent in physical toil with little opportunity to learn economically advantageous skills. The debilitating aspects of slavery may have been even more severe for slaves who worked in the “Western states” of the time - Alabama, Mississippi, and Louisiana. Many of the slaves ending up in these states experienced not one but two devastating dislocations and forced migrations (Berlin, 2010). First, the infamous Middle Passage brought Africans to the New World, primarily to the
Atlantic Coast colonies. Then, many slaves were sold to plantations in the interior states to fuel the growth of the cotton and sugar cane agriculture. The second dislocation and forced migration again tore families apart and destroyed the social capital acquired over years on the farms and plantations of the Eastern colonies. The slaves who came to Mississippi had to start over once more to establish themselves in a new plantation culture. Thus, these groups had little to no preparation to take advantage of the industrial revolution that produced so much wealth for the U.S. in recent centuries.

It may seem strange to begin a section on predicting the future with a discussion of the past. However, the contrast between the opportunities encountered by different groups entering the U.S. provides a powerful insight into the role that history, culture, and timing can have for the life chances of a population. The current disparate effects of poverty, discrimination, and isolation on the health of black Mississippians have their origins in the culture and history of slavery in the U.S. Mississippi has the highest proportion of African-Americans in the nation, and our state feels the legacy of the history and culture of slavery strongly. The lessons embedded in the contrast between the European Jews and the African slaves are not simply that history is “unfair” or that some groups are “luckier” than others, but that preparation for the future, even an unknown future, is incredibly important. But how do you prepare for an unknown future? What education, what techniques, and what experiences will be needed to take advantage of future opportunities? These are very difficult questions, but part of the answer is actually quite simple. By eliminating health disparities in Mississippi, we can position ourselves to be more competitive as opportunities present themselves.

By eliminating health disparities in Mississippi, we position the state to be more competitive as opportunities present themselves.
In the preceding chapters of this assessment, we have provided voluminous evidence on the extent of health disparities for Mississippi. Clearly, large and persistent disparities are a defining aspect of the health status of Mississippi. Consequently, if Mississippi could suddenly become equal to the rest of the nation in its health status, if the racial and geographic health disparities were suddenly removed, there would be truly profound improvements in nearly every important aspect of the life of the state.

In the first chapter of this work, we argue that social determinants of health play a dominant role in the stark health disparities in Mississippi. This argument assumes that poverty results in poor health. In truth, the relationship between poverty and health is reciprocal. Just as the elimination of poverty can lead to improvements in health, improvement in health can lead to increases in prosperity. We can easily imagine that the elimination of health disparities will lead to a healthier population and ultimately to increases in the productivity of the labor force and most likely to the creativity of society. This line of reasoning, backed by a substantial amount of research, has led many to advocate “health as an economic engine for development.” Dr. David Mirvis, at the University of Tennessee Health Science Center, recently edited and contributed to a special volume on health and economic development with a focus on the Mississippi Delta region. Our summary discussion below benefits greatly from the various articles in this publication (Mirvis, et al., 2008; Bloom & Bowser, 2008; Mirvis & Clay, 2008).

The health and wealth paradigm provides one set of answers to the question, “What if we were equal in health status?” If we remove the health disparities that now impact Mississippi, how would this improvement in health generate development and wealth? While prediction can be a risky and difficult enterprise, there is enough known about the consequences of health to make reasoned estimates of how Mississippi would change. To begin, please recall that average health conditions and outcomes for the white population of the U.S. served as our standard of comparison. In observing disparities across a broad range of health indicators, an overall pattern emerged of both white and black Mississippians experiencing significant health disparities in comparison to the rest of the nation. The economic benefits of reducing health disparities should therefore improve the economic circumstances of both black and white Mississipians, and eliminating health disparities will most likely constitute an economic engine for the entire state. However, stark racial differences exist when looking at the magnitude of the health disparities. Black Mississipians most often lag behind national averages in their health conditions and outcomes (and economic status) and have the greatest room for economic growth.
Forecasts on Individuals

To better understand how the elimination of health disparities would increase the wealth of Mississippi, it is useful to distinguish between health impacts on individual and family economic activity and health impacts on overall economic growth. **The quality and length of an individual's life has a huge impact on their ability to generate income and accumulate wealth.** The World Bank (2006) identifies illness or death as the main cause of new or increasing poverty worldwide. Within the U.S., the cost of illness is a major factor in accumulation of personal debt (Himmelstein, et al., 2005). Medical costs are increasingly a decisive factor in personal bankruptcy. **Eliminating disparities in life expectancy and mortality can extend the working years and encourage income growth** (Strauss & Thomas, 1998). **In addition, reducing disparities in health, associated with quality of life, can increase economic value by improving the productivity of each year that the individual works.** A large body of literature associates poor health with worker absenteeism. Chronic health problems can dramatically increase the likelihood of missed work. Workers with chronic health problems were 2 ½ times more likely to miss 6 or more days of work yearly in comparison to those without chronic diseases (Marmot, et al., 1995). Improved health can increase work capacity (vigor, strength, attentiveness, stamina, creativity, and so forth), which in turn can translate into increased economic productivity. To summarize, **the reduction of health disparities in Mississippi at the individual level should lead to dramatic increases in productivity and creativity, reduced absenteeism, and reduced medical costs and should help control the effects of medical services on personal finance.**

Impacts on Families

The elimination of health disparities for children can be even more dramatic in immediate and especially long-term consequences. Since parents commonly miss work to care for their sick children, the elimination of health disparities in children has a direct impact of reducing parental absenteeism and increasing their productivity. More importantly and more profound in its consequences, **poor childhood**
health can influence long run educational achievement, employment, and income. Poor childhood health has been shown to be associated with adult unemployment (Case, et al., 2005), lifetime earnings (Behrman & Rosenzweig, 2004), accumulation of risk factors (Kuh, et al., 2005), school learning (Jamison & Leslie, 1990), cognitive functions (McCarty, et al., 2003), high school graduation (Strully & Conley, 2004), and managerial jobs (Strully & Conley, 2004).

Parental health problems have also been found to have a negative influence on child development, economic development, and future health of their children (Strully & Conley, 2004) and to decrease emotional and physical support for the child. Clearly, the reduction of health disparities in Mississippi would result in a substantially more nurturing environment for children in the state that would in turn increase the probability for long-term health, good cognitive development, and productivity. The reduction of health disparities for children and their parents in Mississippi is a long-term investment whose return is compounded year after year, and the consequences of improved health would be long-term and profound.

**Individual Impacts on State Business**

Eliminating health disparities also has important competitive advantages for Mississippi businesses. Eliminating health disparities in Mississippi would allow local business more equal footing with the rest of the nation. Poor health results in extra costs for businesses because of lost productivity on the job, absenteeism, employee turnover, and costs of healthcare insurance. By eliminating health disparities, Mississippi businesses would improve their productivity, decrease their absenteeism, reduce employee turnover, and obtain more cost-effective health insurance.

**Macroeconomic Impacts - Savings**

The relationship between health and wealth can also be examined from the point of view of population health and macroeconomic performance. Reducing or eliminating disparities in population health for a state may have important impacts that go beyond specific impacts for individuals or businesses. For example, poor health reduces personal savings, thus depressing the amount of capital available for economic investments. Individuals with health problems tend to spend more money on current needs and less on future investments. Also, life expectancy is associated with savings both in terms of the motivation to save and the number of years that savings can accumulate. By eliminating health
disparities, this principle would lead to the prediction that there would be more capital available in Mississippi for economic investment. Bloom and his colleagues (2003) report that for each ten year increase in life expectancy there is a corresponding 4.5% increase in national saving rates. Currently, the life expectancy for the U.S. is estimated at 78.1 years and Mississippi's rate at 73.6 years; a difference in life expectancy of 4.5 years. If Bloom’s national estimates apply to a state, we would expect Mississippi to see an increase in saving rates of over 2% if we attained the same life expectancy as the nation.

**Macroeconomic Impacts - External Investments**

Poor population health has also been found to diminish external investments. Alsan and others (2005) using international data estimate that each additional year of life expectancy is associated with a 7% increase in foreign investment. Again, if such estimates apply for a state, the elimination of life expectancy disparities between Mississippi and the nation would result in a 35% increase in investment from outside the state. Admittedly, this interpretation of international research is highly speculative, but it is not unreasonable to expect similar forces at play at the state level. The increase in capital already mentioned from personal savings and the increase in capital from out-of-state investments would allow increasing investment in the implementation of new technology, business start-ups, technology transfers, and access to global markets (Soares, 2007; Becker, et al., 2003).

**Macroeconomic Impacts - Government Spending**

The elimination of health disparities in Mississippi would also produce shifts in the investment of state and local government in social goods and services. Theoretically, the elimination of health disparities would not only increase economic activity and result in additional revenue from taxation of a larger economy; it would also decrease the demand for government support for health services and free-up government investments for other infrastructure development and services. An important body of research supports the concept that reducing health disparities would contribute to the development of social capital and community cohesion (Kawachi, et al., 1999; David, 2007).

The World Bank identifies illness or death as the main cause of new or increasing poverty worldwide. Within the U.S., the cost of illness is a major factor in accumulation of personal debt. Medical costs are increasingly a decisive factor in personal bankruptcy.
WHAT IF WE STAY UNEQUAL?

In our predictions of the consequences of eliminating health disparities in Mississippi, we have imagined Mississippi’s health indicators and health status rapidly moving toward the U.S. national average, with our state reaping substantial microeconomic and macroeconomic benefits. Bloom and Canning (2000) in their groundbreaking work on the “health and wealth of nations” speak of two quite different trajectories. Since health and wealth are linked in a reciprocal or two-way relationship, they can spiral upward, with each improvement in health resulting in an improvement in wealth that in turn improves health and so on. Of course, the opposite is also quite possible. Declines in health can result in declines in wealth and then to subsequent declines in health, as circumstances spiral downward. The implications are critical for a state with relatively poor health status such as Mississippi. We have assumed an elimination of health disparities and a corresponding upward spiraling of health and wealth in the state. Certain health indicators in Mississippi suggest the spiral is moving in the direction of poorer health. The increase in the chronic diseases of obesity and diabetes portend long-term consequences for the individual, the healthcare system, and the state.

Obesity and diabetes trends among Mississipians, and especially among African-Americans, are alarming. Not only are there substantial racial disparities, the levels of these conditions for the entire population are sharply increasing. Mississippi has the highest rates of obesity in the nation, and within Mississippi, obesity rates are highest among African-Americans. Obesity is worsening for the entire country and Mississippi is leading the nation in this dubious distinction. The impacts of these higher rates of obesity have begun to translate into more obesity-related and diabetes deaths for Mississipians.

One cannot examine the racial disparities in this volume without shock at the extremely high rates of obesity reported by African-American women in particular. In 2007, Mississippi’s black women (47%) were more than twice as likely to be obese as white women nationally (23%). This is the single largest health disparity of our entire analyses. Furthermore, rates of obesity for black women in Mississippi have rapidly increased. Between 2000 and 2007, there was a 20% increase in obesity rates for Mississippi’s black females, while obesity rates for U.S. white women increased about 5%. The implication of this health disparity is somewhat controversial. Some studies contend that the use of obesity measurements developed for white populations may overestimate the obesity levels for minority groups, such as African-
Americans. In fact, a recent study at Baylor University suggests that African-American obesity levels would be more accurately depicted at about a BMI of approximately 32, rather than 30 (Jackson, et al., 2009). Consequently, studies are overestimating African-American obesity. However, even if correction factors were applied for African-American women in Mississippi, the level of the disparity remains substantial. Furthermore, African-American women are experiencing much higher rates of obesity-related morbidity and mortality. Mississippi’s African-American females were three times more likely to die from obesity-related mortality, were twice as likely to be diagnosed with diabetes, and were more than twice as likely to die of diabetes. Due to these very severe disparities, the female African American population demands high priority for research and intervention.

The thrust of our report focuses on the elimination of health disparities in Mississippi and speculates on the consequences of this dramatically improved health upon the state. We have painted a picture of a state with serious health disparities across a broad spectrum of health conditions and outcomes. Every disparity is a potential opportunity for improvement of the condition of the state and its people. We must determine how we move from where we are today with extensive health disparities to one in which we are at least “average” for the nation. For Mississippi to become average in health status would truly be a miraculous turn of events but one that is worthy of our commitment and aspiration. From our perspective, only part of the solution resides in the healthcare system. While quality and access to care must see improvement for the poor, for minorities, and for the isolated; while discrimination based on socioeconomic status, race, and residence must be banished from our healthcare system; while minorities and other underrepresented groups must be trained as healthcare professionals; and while health insurance must be available for everyone, these changes are not sufficient to eliminate all health disparities. Our other institutions have equally important roles to play. Inequalities in the family, in the workplace, in government, in the mass media, and even in religious institutions contribute to overall disparities that influence health status. It is clear that the solution to health disparities is an ambitious and complicated endeavor. A parallel volume to this one that addresses the most promising strategies for eliminating health disparities in Mississippi would be an important and valuable addition to the literature.
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WHAT IF WE WERE EQUAL: A MISSISSIPPI HEALTH ASSESSMENT

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