

CONTEXTS & CONSEQUENCES

DROPOUT RATES

“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).

IMMUNIZATION & INCIDENCE

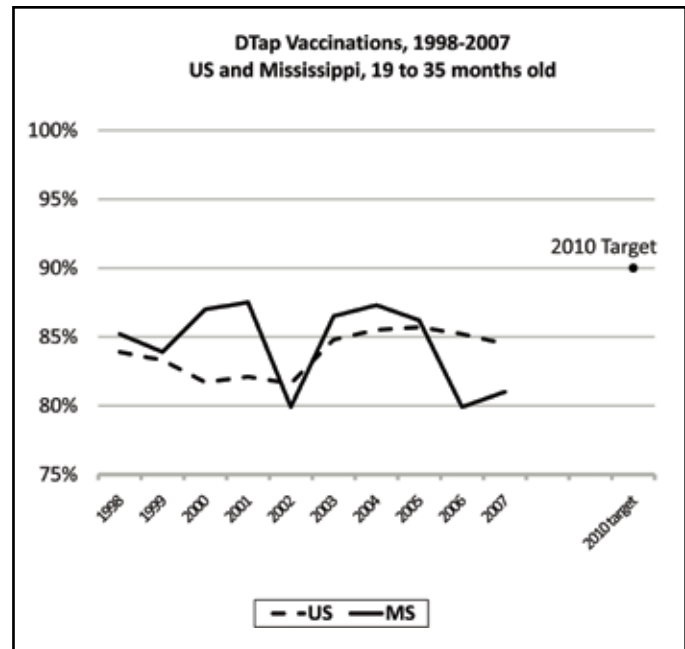
In order to limit the incidence of preventable diseases, Healthy People 2010 outlines targets for immunizations of infants and young adults.

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.**



Source: CDC, Vaccines Statistics, 2005

Recommended Vaccinations, Children 19 to 35 months	1998	2007
DTaP		
US	83.9%	84.5%
MS	85.2%	81.0%

**Because we were not equal...
3.5% fewer Mississippi children
...received the recommended DTaP vaccination
in 2007.**

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.)

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.

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.

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.)

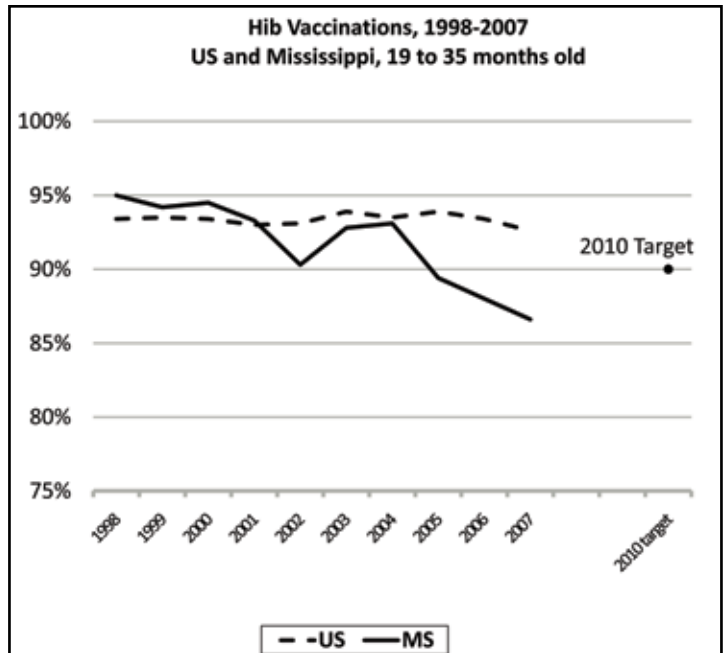
H. influenzae type B

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.



Source: CDC, Vaccine Statistics, 2005

Recommended Vaccinations, Children 19 to 35 months	1998	2007
Hib		
US	93.4%	92.6%
MS	95.0%	86.6%

Because we were not equal...
 6% fewer Mississippi children
 ...received the recommended Hib vaccination in 2007.

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.

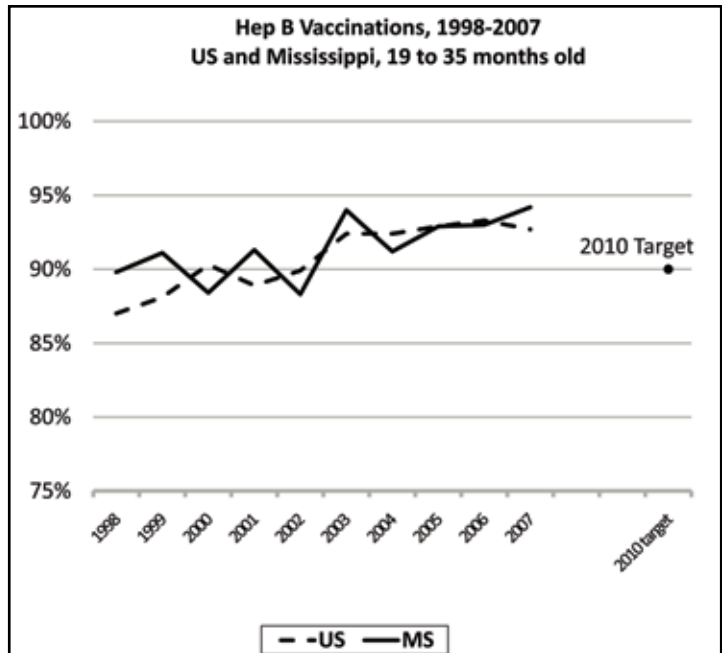
HEPATITIS B

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**.



Source: CDC, Vaccine Statistics, 2005

Recommended Vaccinations, Children 19 to 35 months	1998	2007
HepB		
US	87.0%	92.7%
MS	89.8%	94.2%

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.

Incidence

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.



CONTEXTS & CONSEQUENCES

THE IMMUNIZATIONS & AUTISM MYTH: A PUBLIC HEALTH PROBLEM

“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

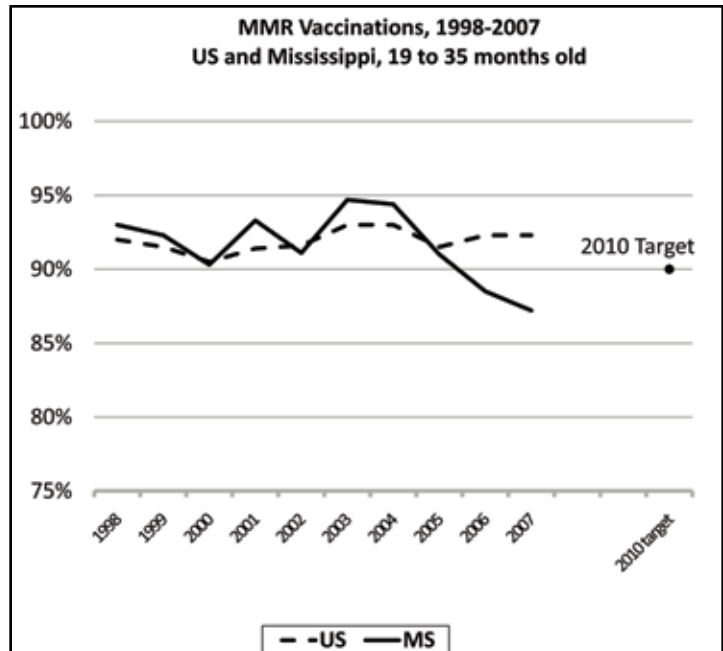
The Measles, Mumps, and Rubella (MMR) vaccination protects against three highly contagious diseases: measles, mumps, and rubella. These have the potential for a variety of serious consequences such as brain damage (measles), deafness (mumps), death (measles and mumps), and miscarriage and congenital 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%.



Source: CDC, Vaccine Statistics, 2005

Recommended Vaccinations, Children 19 to 35 months	1998	2007
MMR		
US	92.0%	92.3%
MS	93.0%	87.2%

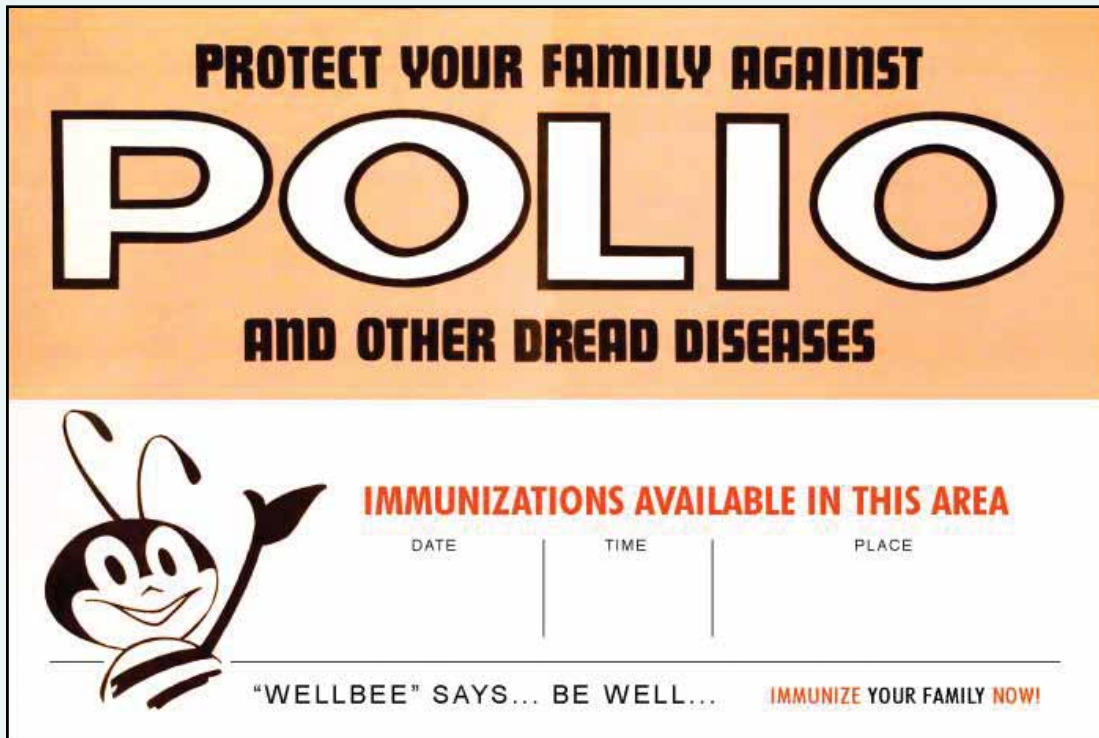
Because we were not equal...
 5.1% fewer Mississippi children
 ...received the recommended MMR vaccination in 2007.

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.)

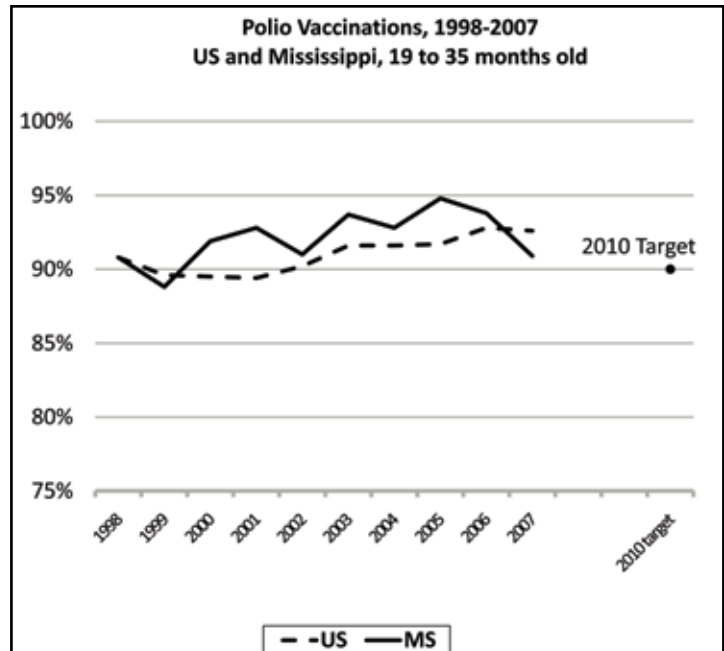
POLIO

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.



Source: CDC, Vaccine Statistics, 2005

Recommended Vaccinations, Children 19 to 35 months	1998	2007
Polio		
US	90.8%	92.6%
MS	91.8%	90.9%

Because we were not equal...
 1.7% fewer Mississippi children
 ...received the recommended Polio vaccination in 2007.

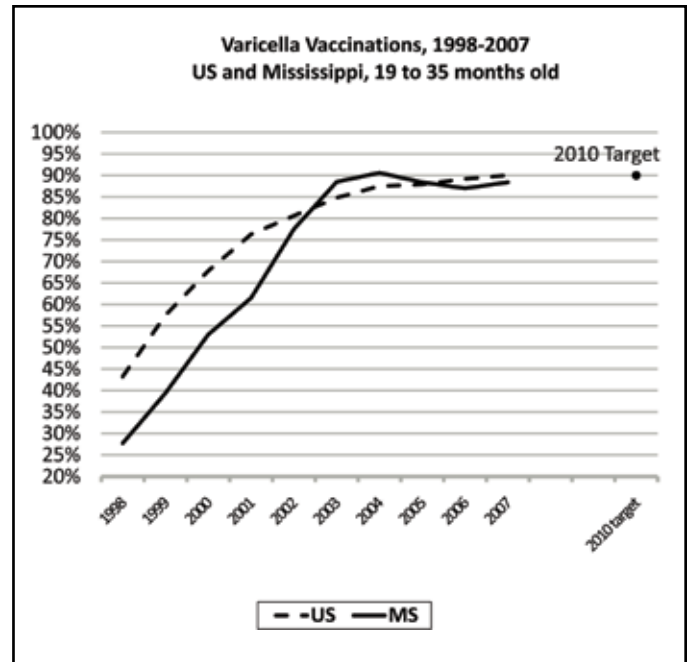
VARICELLA

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.**



Source: CDC, Vaccine Statistics, 2005

Recommended Vaccinations, Children 19 to 35 months	1998	2007
Varicella		
US	43.0%	90.0%
MS	27.7%	88.4%

Because we were not equal...
 1.6% fewer Mississippi children
 ...received the recommended Varicella vaccination in 2007.

Estimated Effects of DTaP Vaccination in 2001		
	Lives Saved	Dollars Saved
Diphtheria vaccination	24,721	\$24.9 billion
Tetanus vaccination	8	\$28 million
Pertussis vaccination	1,008	\$3.55 billion
<i>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).</i>		
Estimated Effects of H. influenza type B Vaccination in 2000		
	Direct Costs	Societal Costs (direct plus indirect)
Cost of vaccination program	\$0.39 billion	\$0.48 billion
Cost if program no program existed	\$1.35 billion	\$2.58 billion
<i>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).</i>		
Estimated Effects of HepB Vaccination in 2001		
	Lives Saved	Dollars Saved
HepB vaccination	3,024	\$1.12 billion
<i>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).</i>		
Estimated Effects of MMR Vaccination in 2001		
	Lives Saved	Dollars Saved
Measles vaccination	2,794	\$5.87 billion
Mumps vaccination	11	\$1.46 billion
Rubella vaccination	14	\$380 million
<i>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).</i>		
Estimated Effects of Polio Vaccination in 2001		
	Lives Saved	Dollars Saved
Polio vaccination	723	\$4.89 billion
<i>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).</i>		
Estimated Effects of Varicella Vaccination in 2001		
	Lives Saved	Dollars Saved
Chickenpox vaccination	57	\$993 million
<i>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).</i>		

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).

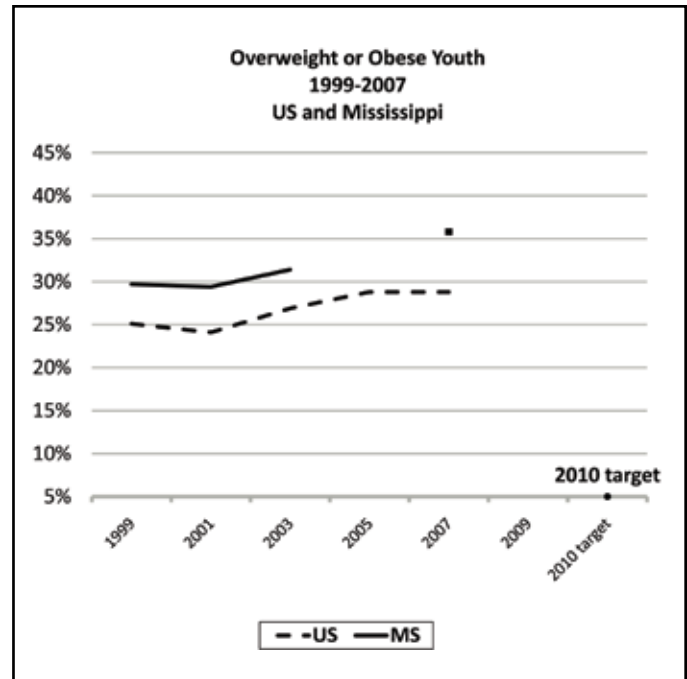
Mississippi, the Nation, and Healthy People 2010

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%.

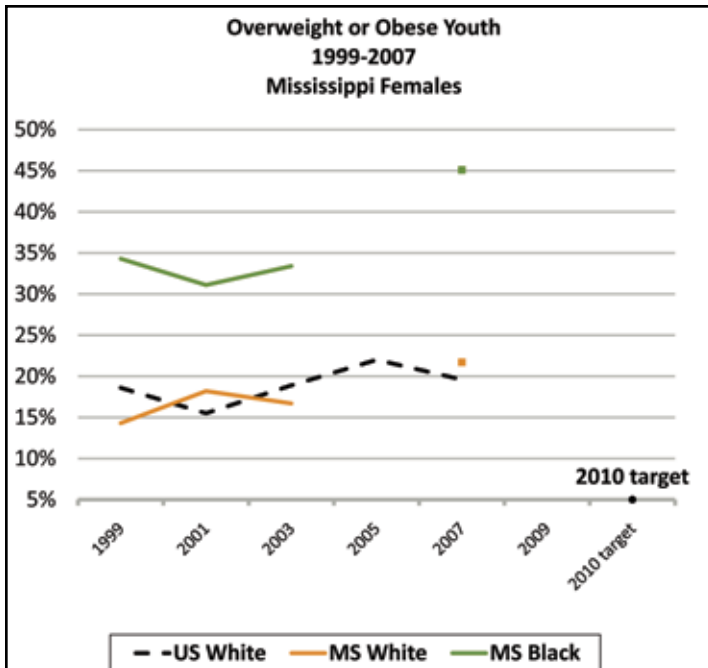


Source: CDC, Youth Risk Behavior Surveillance System (YRBSS), n.d.d

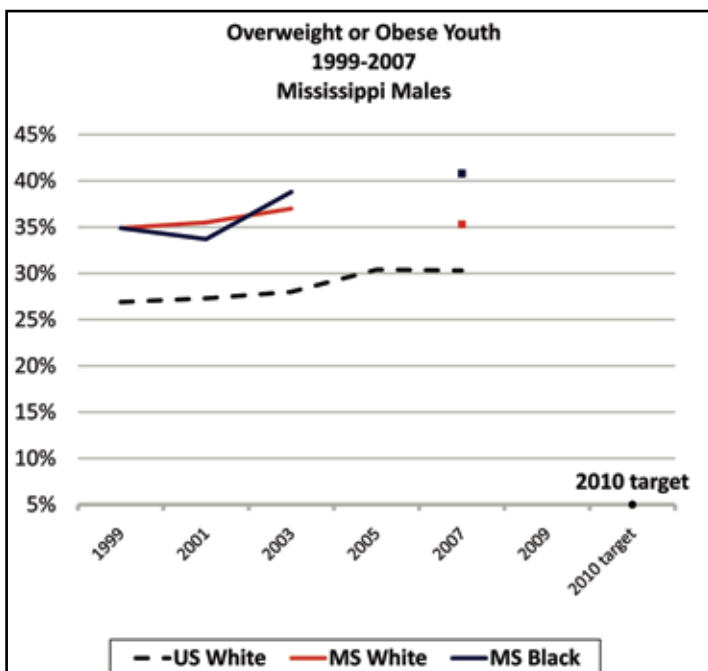
As of the 2007-2008 school year, full calorie, sugared carbonated soft drinks were no longer sold to Mississippi school students during the day, and as of the 2008-2009 school year, only select beverage options were made available through school vending machines

(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.



Source: CDC, YRBSS, n.d.d



Source: CDC, YRBSS, n.d.d

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 Mississippians 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.

Overweight or Obese Youth	1999	2007
US white male	26.9%	30.3%
MS white male	34.9%	35.3%
MS black male	34.9%	40.8%
US white female	18.6%	19.6%
MS white female	14.3%	21.7%
MS black female	34.3%	45.1%

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.



CONTEXTS & CONSEQUENCES

CHILDHOOD OBESITY & SOCIOECONOMIC STATUS

“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 collinearity 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).



CONTEXTS & CONSEQUENCES

MISSISSIPPI EFFORTS AGAINST CHILDHOOD OBESITY

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).

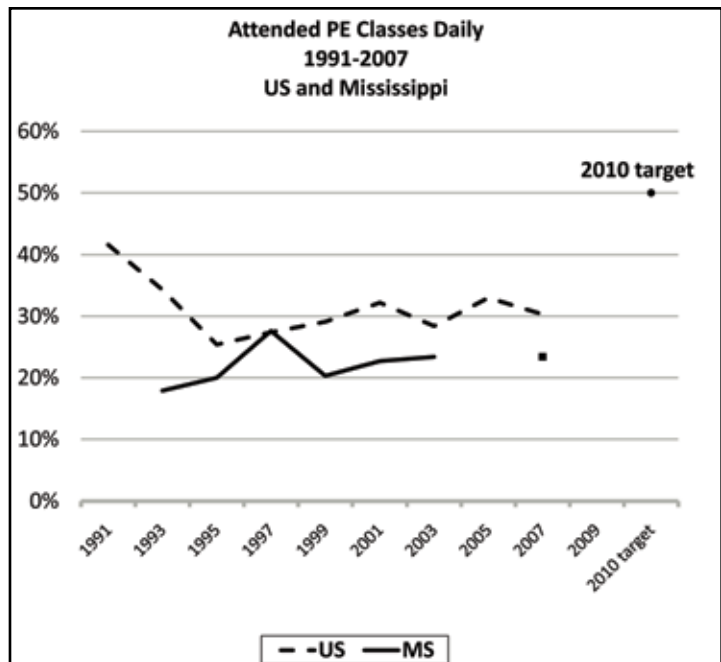
DAILY SCHOOL PHYSICAL EDUCATION

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.

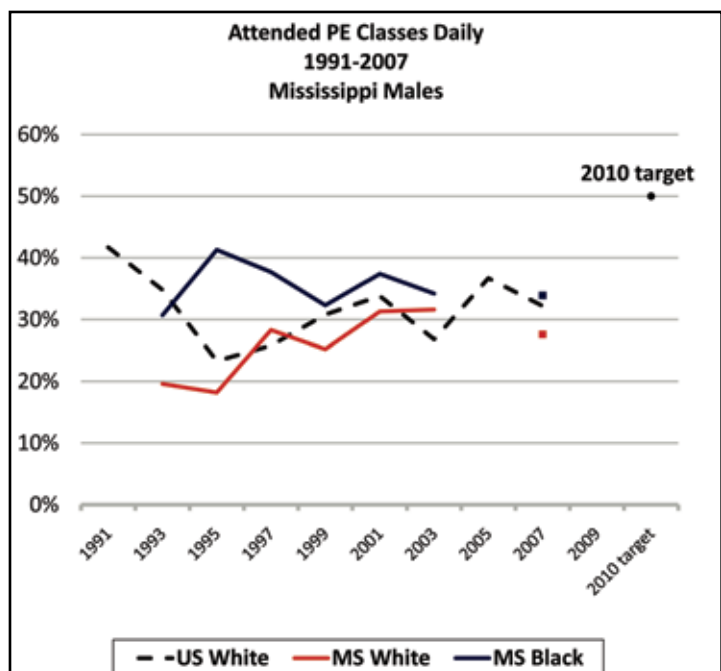
Mississippi, the Nation, and Healthy People 2010

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.

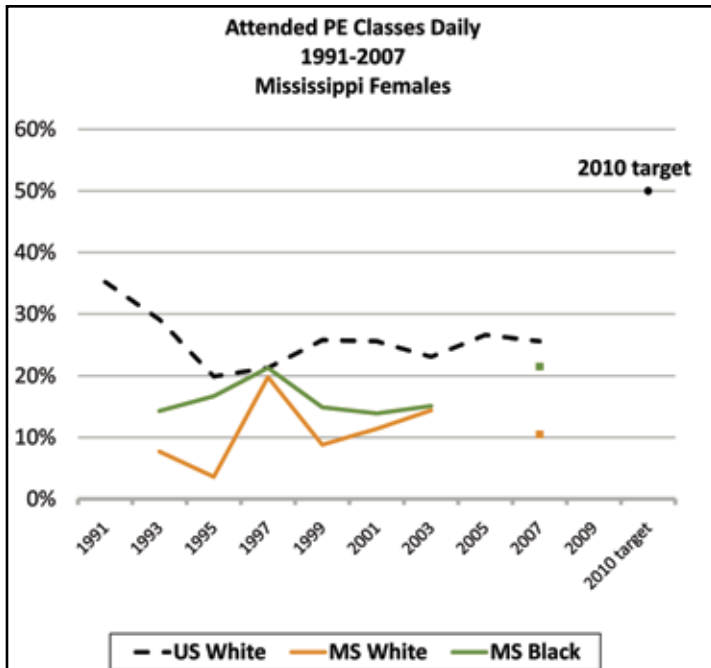


Source: CDC, YRBSS, n.d.d

Attended PE Class Daily	1993	2007
US white male	34.8%	32.2%
MS white male	19.6%	27.6%
MS black male	30.7%	33.9%
US white female	29.1%	25.6%
MS white female	7.7%	10.5%
MS black female	14.3%	21.5%



Source: CDC, YRBSS, n.d.d



Source: CDC, YRBSS, n.d.d

Because we were not equal...

4.1% fewer black females in Mississippi

4.6% fewer white males in Mississippi

15.1% fewer white females in Mississippi

...attended PE class daily in 2007.

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.

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 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%).



CONTEXTS & CONSEQUENCES

THE IMPORTANCE OF EXERCISE IN CHILD OBESITY INTERVENTIONS



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 unchanging). These disparities may be attributable to problems in access to care (MMWR, 2007).



CONTEXTS & CONSEQUENCES

PUBLIC HEALTH INSURANCE FOR CHILDREN

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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