

# Black–White Health Disparities in the United States and Chicago: A 15-Year Progress Analysis

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Racial disparities in health in the United States have been well documented, and federal initiatives have been undertaken to reduce these disparities. One of the first federal initiatives to bring awareness to racial disparities in health was the 1985 Report of the Secretary's Task Force on Black and Minority Health, which highlighted the need for programs and policies to address disparities in health within the United States.<sup>1</sup> Many initiatives have followed. The most recent federal initiative is Healthy People 2010, which consists of 2 main goals, 28 focus areas, and 467 objectives. One of the main goals is the elimination of health disparities within the United States.<sup>2</sup> This builds upon one of the goals from Healthy People 2000, which aimed at the reduction of health disparities.<sup>3</sup>

Interestingly, although the reduction and elimination of health disparities are declared priorities, there are few reports that comprehensively examine progress in this area by analyzing changes in multiple indicators. In 2001, Silva et al. published a study of 22 health status indicators in Chicago, Illinois, and compared outcomes for Black and White people between 1980 and 1998.<sup>4</sup> An important contribution in this area came from Keppel et al. in 2002 when they evaluated the Healthy People 2000 goal of reducing health disparities at the national level by examining progress in reducing disparities among the 5 largest racial/ethnic groups in the United States for 17 health status indicators between 1990 and 1998.<sup>5</sup> The analysis revealed that for the majority of indicators, racial/ethnic disparities had declined over the period on the national level. However, a comparable Chicago-specific analysis by Margellos et al. focusing on non-Hispanic Black–non-Hispanic White disparities found that although the majority of Black–White disparities narrowed nationally between 1990 and 1998, the opposite was true in Chicago with the majority widening over the same interval.<sup>6</sup>

First, we wanted to determine whether the Black–White disparity within each of 15 health

**Objectives.** In an effort to examine national and Chicago, Illinois, progress in meeting the Healthy People 2010 goal of eliminating health disparities, we examined whether disparities between non-Hispanic Black and non-Hispanic White persons widened, narrowed, or stayed the same between 1990 and 2005.

**Methods.** We examined 15 health status indicators. We determined whether a disparity widened, narrowed, or remained unchanged between 1990 and 2005 by examining the percentage difference in rates between non-Hispanic Black and non-Hispanic White populations at both time points and at each location. We calculated *P* values to determine whether changes in percentage difference over time were statistically significant.

**Results.** Disparities between non-Hispanic Black and non-Hispanic White populations widened for 6 of 15 health status indicators examined for the United States (5 significantly), whereas in Chicago the majority of disparities widened (11 of 15, 5 significantly).

**Conclusions.** Overall, progress toward meeting the Healthy People 2010 goal of eliminating health disparities in the United States and in Chicago remains bleak. With more than 15 years of time and effort spent at the national and local level to reduce disparities, the impact remains negligible. (*Am J Public Health*. Published online ahead of print December 17, 2009; e1–e8. doi:10.2105/AJPH.2009.165407)

status indicators had widened, narrowed, or stayed the same over a 15-year period in Chicago and in the United States. Second, we wanted to determine whether, taken together, there was a general shift toward widening, narrowing, or no change in the Black–White disparity in Chicago and the United States. This updates the work of both Keppel et al. and Margellos et al. to consider progress toward reducing and eventually eliminating Black–White disparities nationally and in Chicago for 1990 to 2005, thus adding a 7-year update to each of these previous reports. The analysis of national progress serves as a benchmark to examine Chicago's progress within a national context.

## METHODS

Table 1 presents the 15 health status indicators included in this article, 13 of which were included in previous articles by Margellos et al. and Keppel et al.<sup>5,6</sup> We computed all 15 health status indicators for Chicago's non-Hispanic Black and non-Hispanic White populations

for the years 1990 and 2005 and we compared them with national data for the same indicators and years.

## Measures Employed

The 10 indicators of mortality are age-adjusted with the 2000 US population as the standard and are expressed per 100 000 population (or per 100 000 women for female breast cancer). We employed the corresponding *International Classification of Diseases, Tenth Revision (ICD-10)* codes,<sup>7</sup> listed in Table 1. Because 1990 cause-specific mortality data were generated with *International Classification of Diseases, Ninth Revision (ICD-9)* codes,<sup>8</sup> we used an age-specific comparability ratio formula designed specifically for transforming age-adjusted rates<sup>9</sup> from the *ICD-9* to *ICD-10* coding so that the 1990 and 2005 rates were comparable. The infant mortality rate is expressed as the number of deaths among infants (in the first year of life) per 1000 live births. United States infant mortality rates are calculated with linked birth–death files. Because this source was not readily available for Chicago, we calculated this rate by

**TABLE 1—Health Status Indicators Included in the Analysis of Black-White Health Disparities: United States and Chicago, IL, 1990 and 2005**

Health Status Indicators	ICD-9 codes	ICD-10 codes
<b>Mortality rates</b>		
Heart disease	390-398, 402, 404-429	I00-I09, I11, I13, I20-I51
Stroke	430-438	I60-I69
Cancer	140-208	C00-C97
Lung cancer	162.0	C33-C34
Female breast cancer	174	C50
Motor vehicle crash	E810-E825	V02-V04, V09.0, V09.2, V12-V14, V19.0-V19.2, V19.4-V19.6, V20-V79, V80.3-V80.5, V81.0-V81.1, V82.0-V82.1, V83-V86, V87.0-V87.8, V88.0-V88.8, V89.0, V89.2
Suicide	E950-E959	U03, X60-X84, Y87.0
Homicide	E960-E978	U01-U02, X85-Y09, Y87.1
Diabetes mellitus	250	E10-E14
All cause		
<b>Birth-related outcomes</b>		
Infant mortality rate		
Percentage low-birthweight babies		
Percentage of women with no prenatal care in first trimester		
<b>Communicable disease incidence</b>		
Tuberculosis		
Primary and secondary syphilis		

Note. ICD-9 = International Classification of Diseases, Ninth Revision<sup>8</sup>; ICD-10 = International Classification of Diseases, Tenth Revision.<sup>7</sup>

dividing the number of infant deaths in a given year by the number of live births in that same year. Low-birthweight (<2500 g) babies and women with no prenatal care in the first trimester are expressed as percentages and are restricted to the population for which data regarding birthweight status and trimester of care were known, respectively. The 2 communicable disease incidence rates, for tuberculosis and primary and secondary syphilis, were calculated per 100 000 population (unadjusted for age).

### Chicago Data

Communicable disease data were derived from their respective registries maintained by the Chicago Department of Public Health. All other Chicago numerators were abstracted from the vital records (birth and death) files maintained by the Illinois Department of Public Health.

Population-based denominators for Chicago in 1990 were gathered from the Census.<sup>10</sup> Population-based denominators for non-Hispanic Whites in 2005 were gathered from the American Community Survey.<sup>11</sup> Population-based denominators for the non-Hispanic Black population in 2005 were not readily available so we estimated the population by using an age-specific ratio calculated by dividing the number of non-Hispanic Blacks by total Blacks in the 2000 Census<sup>10</sup> and multiplying the proportion by the number of all Blacks in 2005 from the American Community Survey for each age group.

### National Data

Numerators were obtained through a special request from the National Center for Health Statistics and through published reports. Population-based denominators for 1990 were

derived from Census data.<sup>10</sup> Population-based denominators for non-Hispanic Whites in 2005 were gathered from the American Community Survey.<sup>11</sup> Population-based denominators for the non-Hispanic Black population in 2005 were not readily available and were therefore estimated by using the same methodology employed to estimate the 2005 non-Hispanic Black population in Chicago.

### Analysis of Trends

To measure disparity we calculated the percentage difference between the non-Hispanic Black and non-Hispanic White rates for 1990 and 2005. The sign of the percentage difference is positive if the non-Hispanic Black rate is higher than the non-Hispanic White rate and negative if the non-Hispanic White rate is higher than the non-Hispanic Black rate. The disparity is widening if the percent difference is getting larger and narrowing if the percent difference is getting smaller (regardless of sign).

### Statistical Analyses

To determine whether a disparity widened or narrowed significantly between 1990 and 2005, we calculated a 2-sided *z* score by using a bootstrap technique developed by Keppel et al.<sup>12</sup> and examined the corresponding *P* value for the *z* score. To measure the significance of the overall trend between 1990 and 2005 in each location, we calculated a binomial probability of the trend. This measures the probability that the observed number of disparities (among the 15 indicators) would move in the observed direction by chance. A *P* value of less than .05 was considered significant for all analyses.

## RESULTS

Table 2 presents results for the United States. For both 1990 and 2005, the non-Hispanic Black rate for nearly all health status indicators was higher than the non-Hispanic White rate. The exceptions were suicide mortality at both time points and 2005 motor vehicle crash mortality. Both non-Hispanic Black and non-Hispanic White people experienced improvements in the vast majority of health status indicators between 1990 and 2005, with a few notable exceptions. For non-Hispanic Blacks, the notable exception was the diabetes mortality rate, which increased by 40.5% over the time

**TABLE 2—Health Status Indicators and Rates, by Race, Year, and Associated Black-White Percentage Differences: United States, 1990 and 2005**

Indicator	Non-Hispanic Black Rate	Non-Hispanic White Rate	Difference, %	P
All-cause mortality <sup>a</sup>				<.001
1990	1170.1	867.7	34.9	
2005	1147.7	892.1	28.7	
Heart disease mortality <sup>a</sup>				<.001
1990	354.2	298.9	18.5	
2005	308.2	241.9	27.4	
Stroke mortality <sup>a</sup>				NS
1990	89.2	63.2	41.2	
2005	74.5	52.3	42.5	
Cancer mortality <sup>a</sup>				<.001
1990	264.0	206.6	27.8	
2005	245.8	200.6	22.5	
Lung cancer mortality <sup>a</sup>				<.001
1990	66.6	56.5	17.9	
2005	63.8	58.6	8.8	
Female breast cancer mortality <sup>b</sup>				<.001
1990	35.9	32.1	11.8	
2005	35.5	25.8	37.9	
Diabetes mellitus mortality <sup>a</sup>				<.001
1990	37.3	17.8	109.8	
2005	52.4	23.6	121.9	
Motor vehicle crash mortality <sup>a</sup>				<.05
1990	17.3	16.6	4.2	
2005	16.2	16.4	-0.8	
Suicide mortality <sup>a</sup>				<.001
1990	6.6	13.0	-49.3	
2005	5.9	13.5	-56.4	
Homicide mortality <sup>a</sup>				NS
1990	35.1	3.9	788.3	
2005	24.3	2.8	772.1	
Infant mortality rate <sup>c</sup>				NS
1990 <sup>d</sup>	16.9	7.2	134.7	
2005	13.6	5.8	134.5	
% low-birthweight babies				<.001
1990	13.3	5.6	137.5	
2005	14.0	7.3	91.8	
% no prenatal care in first trimester				<.001
1990	39.3	16.7	135.3	
2005 <sup>e</sup>	23.5	11.3	108.0	
Tuberculosis case rate <sup>f</sup>				<.001
1990	33.0	4.2	685.7	
2005	11.6	1.3	792.3	

Continued

period. For non-Hispanic Whites the notable exceptions were diabetes mortality and percentage of low birthweight babies where the rates increased sizably (by 32.6% and 30.4%, respectively).

Between 1990 and 2005, the non-Hispanic Black–non-Hispanic White disparities narrowed for 8 of the 15 measures (Table 2), 7 significantly (all-cause mortality, cancer mortality, lung cancer mortality, motor vehicle crash mortality, percentage low birthweight babies, percentage no prenatal care in the first trimester, and primary and secondary syphilis case rate). During the same time period, the disparities widened for 6 of the 15 measures, 5 significantly (heart disease mortality, female breast cancer mortality, diabetes mortality, suicide mortality, and tuberculosis case rate). Although the disparity in the suicide mortality rate did widen, this was mostly because of an increase in the non-Hispanic White rate, which disguises the fact that the non-Hispanic Black rate actually decreased slightly during this period. The disparity for infant mortality remained virtually unchanged.

Table 3 presents results for Chicago. The non-Hispanic Black rate was higher than the non-Hispanic White rate at both time points for 13 of the 15 indicators, with the exceptions being suicide mortality at both time points and the primary and secondary syphilis case rate in 2005. For the vast majority of the indicators, the rates for both non-Hispanic Black and non-Hispanic White people improved over the time period. Among non-Hispanic Blacks, the only indicator that worsened was percentage of low-birthweight babies, which increased only slightly (1.3%). For non-Hispanic Whites, diabetes mortality increased slightly (1.8%), the primary and secondary syphilis case rate increased dramatically (480%), and the percentage of low birthweight babies also increased (18.8%). Disparities narrowed for 4 of the 15 measures, 2 significantly (percentage of low birthweight babies and, primary and secondary syphilis case rate). The narrowing of the disparity in the percentage of low birthweight babies is misleading however, in that the rates for both groups increased from 1990 to 2005 with the non-Hispanic White rate increasing more drastically than the non-Hispanic Black rate, resulting in a narrowing of the disparity. In addition, disparities widened for 11 of the 15

TABLE 2—Continued

Primary and secondary syphilis case rate <sup>f</sup>				<.001
1990	142.5	2.6	5380.8	
2005	10.6	1.8	488.9	

Notes. NS = not significant. 1990 cause-specific mortality rates are modified by a comparability ratio to be comparable to 2005 rates.

<sup>a</sup>Age-adjusted and expressed per 100 000 population.

<sup>b</sup>Age-adjusted and expressed per 100 000 women.

<sup>c</sup>Number of deaths among infants (in the first year of life) per 1000 live births.

<sup>d</sup>In 48 states and DC only. Hispanic origin was not reported in 1990 by New Hampshire and Oklahoma.

<sup>e</sup>Based upon 37-state reporting area that used the 1989 revision of the US certificate of live birth.

<sup>f</sup>Per 100 000 population.

measures in Chicago, 5 significantly (all-cause mortality, heart disease mortality, female breast cancer mortality, percentage with no prenatal care first trimester, and tuberculosis case rate).

We also examined whether there were discernable trends in the disparities by using a binomial test, independent of individual health status indicator significance. For the United States, there was no significant trend among the 15 health status indicators toward either narrowing or widening ( $P=.85$ ). For Chicago, there was a marginally significant trend toward widening ( $P=.06$ ).

## DISCUSSION

Since 1980 the United States has proclaimed an explicit commitment to improving health for all groupings of people. More recently the reduction and eventual elimination of disparities has been touted as a major goal, with 1 specific area of focus being disparities by race and ethnicity.<sup>2,3</sup> Although it is common for racial and ethnic disparities to be examined for selected health conditions,<sup>13–15</sup> only rarely have researchers examined several simultaneously.<sup>4–6,16–18</sup> In response to this situation, we examined progress toward the elimination of racial disparities in health for the United States and Chicago by examining non-Hispanic Black and non-Hispanic White rates and percentage differences in rates for 15 health status indicators for 1990 and 2005.

For the United States, we found that the percentage difference narrowed significantly for 7 of the 15 health status indicators over this 15-year interval, whereas 1 other health status indicator improved but not significantly. Thus,

only about half of the health status indicators moved toward equality over the interval. However, even when moving in the desired direction, the progress was generally slow. Movement in the opposite (widening) direction was about the same (Table 2). Indeed, there was no significant trend toward overall improvement ( $P=.85$ ).

Matters are even worse in Chicago, where 11 of the 15 measures of disparity widened, 5 significantly. The other 4 disparities narrowed, but only 2 of them narrowed significantly. It is instructive to look at some of these disparities individually. For example, in 1990 the non-Hispanic Black all-cause mortality rate was 36% higher than the non-Hispanic White rate; by 2005, the disparity had widened to 42% ( $P<.001$ ). In other words, non-Hispanic Black health worsened relative to non-Hispanic White health over an interval when the United States was prioritizing the reduction and eventual elimination of health disparities. As another example, in 1990 the breast cancer mortality rate was 20% higher in non-Hispanic Black women; in 2005 it was 99% higher ( $P<.001$ ). This is nearly a 5-fold increase in the level of disparity. Disparity in mortality from heart disease, the leading killer of people in the United States, also increased over the interval. In 1990, non-Hispanic Black people were 8.4% more likely to die of heart disease than non-Hispanic White people; by 2005 the disparity had increased to 24.3% ( $P<.001$ ).

Interestingly, when health status indicators that were narrowing were examined at 4 time points (1990, 1995, 2000, 2005), the overall trend was not consistently linear, suggesting that disparities were generally stagnant and no

progress was being made toward elimination even among health status indicators that narrowed between 1990 and 2005. This is consistent with a previous report that estimated that non-Hispanic Black–non-Hispanic White disparities in life expectancy will never be eliminated if current trends continue.<sup>19</sup>

When we generated such comparisons in an earlier paper comparing 1990 and 1998,<sup>6</sup> the data painted a gloomy picture; but now, 7 years later, these 15-year comparisons suggest an even bleaker reality. Not only are we generally not eliminating disparities (Healthy People 2010 goal) in either the United States or Chicago, but in the majority of cases we are not even reducing them (Healthy People 2000 goal). Stated starkly, we are either stagnant or are moving in the wrong direction. This is especially poignant given that these health status indicators were measured and evaluated during years when the economy was generally expanding and before the economic difficulties facing the country as we write. The sharp downturn in the economy that we are now facing will likely lead to further exacerbations of racial disparities in health.<sup>20–22</sup>

The contrast between the minimal progress being made by the United States as a whole toward the reduction or elimination of racial health disparities on the one hand and the backward propulsion of Chicago on the other is a matter of great concern. There are 2 broad sets of explanations for this. The first is that urban areas in general may be doing worse in reducing or eliminating racial health disparities. The second is that Chicago is faring worse than most in its efforts to reduce or eliminate disparities. These are empirical questions that await further analysis. One piece of information that we have gathered from our work in breast cancer mortality disparities<sup>23</sup> is that Chicago fares much worse than New York City, New York, on this particular health status indicator (S. Whitman PhD, unpublished data, 2009). If this were true for other measures as well, then this evidence would speak to Chicago's experience and progress being worse than most other urban areas.

Overall, there are many hypothesized causes for racial disparities in health. Research has shown that some of the disparity can be attributed to differences in socioeconomic status because Blacks are systematically poorer than Whites in the United States. However,

**TABLE 3—Health Status Indicators and Rates, by Race, Year, and Associated Black-White Percentage Differences: Chicago, IL, 1990 and 2005**

Indicator	Non-Hispanic Black Rate	Non-Hispanic White Rate	Difference, %	P
All-cause mortality <sup>a</sup>				<.001
1990	1429.0	1053.9	35.6	
2005	1183.7	834.2	41.9	
Heart disease mortality <sup>a</sup>				<.001
1990	420.0	387.3	8.4	
2005	329.2	264.9	24.3	
Stroke mortality <sup>a</sup>				NS
1990	81.5	60.1	35.7	
2005	67.6	43.3	56.1	
Cancer mortality <sup>a</sup>				NS
1990	324.6	244.9	32.5	
2005	272.7	192.2	41.9	
Lung cancer mortality <sup>a</sup>				NS
1990	83.4	61.6	35.3	
2005	73.2	50.7	44.4	
Female breast cancer mortality <sup>b</sup>				<.001
1990	44.2	37.0	19.5	
2005	43.2	21.8	98.5	
Diabetes mellitus mortality <sup>a</sup>				NS
1990	39.4	22.2	77.4	
2005	37.8	22.6	67.0	
Motor vehicle crash mortality <sup>a</sup>				NS
1990	16.0	14.3	11.9	
2005	12.0	9.1	32.4	
Suicide mortality <sup>a</sup>				NS
1990	7.8	14.4	-46.0	
2005	4.6	12.4	-62.8	
Homicide mortality <sup>a</sup>				NS
1990	58.4	7.0	735.0	
2005	38.1	3.3	1040.6	
Infant mortality rate <sup>c</sup>				NS
1990	23.1	7.5	208.0	
2005	14.1	6.3	123.8	
% low-birthweight babies				<.001
1990	15.4	6.4	141.3	
2005	15.6	7.6	105.3	
% no prenatal care, first trimester				<.001
1990	38.3	17.5	118.5	
2005	24.5	8.2	198.8	
Tuberculosis case rate <sup>d</sup>				<.001
1990	35.7	8.7	310.2	
2005	18.2	3.1	496.6	

Continued

socioeconomic differences do not entirely explain racial disparities in health. For example, several studies have shown that within each income or education level, Blacks have worse health compared with Whites.<sup>24,25</sup> Additional research into other contributing factors of racial disparities in health has shown that racism also plays a role because of the stress that is generated by perceptions of racism<sup>26</sup> and many other structural issues.<sup>16,27,28</sup> Racism on a societal level can lead to segregation, which in turn can affect education opportunities and available resources, and consequently socioeconomic status.<sup>29</sup> In fact, studies have shown that racial segregation in health care<sup>30,31</sup> and housing<sup>16,32</sup> are prominent causes of poor health for those who are segregated. Interestingly, Chicago is one of the most segregated cities in the country.<sup>33</sup>

We also note here the relevance of evaluating the progress being made on reducing the health status indicator disparities for geographic units below the national level. Important insights can be gained from understanding how cities, states, urban areas collectively, rural areas, etc. are progressing. Yet, we are not aware of any other report that addresses this question. Indeed, insights would be even more likely if other cities would replicate disparities studies such as the current one. For example, how do racial disparities vary between Chicago and New York or among the 10 largest cities or in rural areas? Such analyses offer us the potential to gain a better understanding of how we might eliminate disparities, and for this reason we hope that such research will be forthcoming.

Another reason for such study at the local level is that results offer the possibility of catalyzing action. It is one thing to document disparities at the national level but quite a different matter to present them for a given city. For example, when our prior analysis was published<sup>6</sup> the media attention was substantial,<sup>34-35</sup> and a city-wide disparities conference was held, sponsored by the Institute of Medicine—Chicago and stimulated in large part by that article. Perhaps the most notable finding that led to action was the racial disparity in breast cancer mortality.<sup>23,36,37</sup> In addition to gaining media and community-wide attention, it also led to the formation of the Metropolitan Chicago Breast Cancer Task Force,<sup>38,39</sup> which is mobilizing to eliminate disparities in breast

TABLE 3—Continued

Primary and secondary syphilis case rate <sup>d</sup>				<.001
1990	133.1	4.5	2828.1	
2005	17.7	21.6	-18.2	

Notes. NS = not significant. 1990 cause-specific mortality rates are modified by a comparability ratio to be comparable to 2005 rates.

<sup>a</sup>Age-adjusted and expressed per 100 000 population.

<sup>b</sup>Age-adjusted and expressed per 100 000 women.

<sup>c</sup>Number of deaths among infants (in the first year of life) per 1000 live births.

<sup>d</sup>Per 100 000 population.

health in the area. This organizing has been in direct response to the kind of local-level data presented in Table 3.

Findings of this nature should provoke us to think about what can be done to ameliorate disparities like these. Such a question must be posed—and answers provided—if we are to make progress in this area. To render thinking about this issue manageable we should begin by realizing that there are 2 large sets of causes of these disparities—distal (fundamental or upstream) ones and proximal (downstream) ones. The fundamental ones involve structural issues such as racism, poverty, and so on.<sup>40–42</sup> These in turn generate the proximal causes including segregation,<sup>33</sup> substandard housing<sup>43</sup> and schools,<sup>44</sup> poor health care,<sup>45,46</sup> etc. Although ultimate solutions will depend upon us altering the fundamental causes, by fighting to eliminate (for example) racism and poverty,<sup>47,48</sup> we must also devise programs and interventions to deal with disparities in health conditions 1 disease at a time and on the ground, starting now. Various community-based organizations, academic institutions, and public health agencies have been attempting such work in areas ranging from HIV<sup>49</sup> to pediatric asthma<sup>50</sup> to the fight against racial disparities in breast cancer mortality.<sup>51</sup> If disparities are to be eliminated, effective approaches need to be quickly disseminated and widely implemented in areas where the need exists, and policy supporting the replication of effective interventions must be developed.

Two observations seem relevant here. First, of all recent times these will no doubt be among the most difficult in fighting disparities as resources for interventions and new programs, both public and private, shrink. Second, it is essential that, even when we are able to create and sustain effective interventions that will

ameliorate health disparities, we keep in mind the importance of the fundamental causes making such programs necessary and the need to eliminate these fundamental causes to build a healthier society.

### Methodological Considerations

There are methodological considerations relevant to this analysis. To begin with, there are various ways to measure disparities in health with advantages and disadvantages to each method.<sup>12,52–55</sup> Our rationale for examining disparities by using relative differences for adverse events over time and using White as the reference group, while also reporting absolute rates, was 2-fold. First, this type of analysis illuminated our research questions and was congruent with published literature regarding suggested methods to examine disparities.<sup>53</sup> This methodology was also chosen in an effort to be consistent with a national-level analysis by Keppel et al., which also measured health disparities within the context of Healthy People 2010 goals.<sup>18</sup>

There is also a caveat to using “widening” and “narrowing” when one describes a disparity between 2 groups. It is possible that absolute rates among each group may not be declining to create a “narrowing” disparity. For example, there was a narrowing of the non-Hispanic Black–non-Hispanic White disparity in percentage of low birthweight babies for the United States. However, the rate within each group actually increased from 1990 to 2005. Thus, improving health within each group and reducing disparities between groups can, but do not always, align. This is why we included the absolute rates for Blacks and Whites at each time period in our analysis so that divergence in these 2 concepts, when

applicable, could be identified. Furthermore, for a few of the health status indicators, the group with the lower rate was not Whites (United States: suicide mortality, motor vehicle crash in 2005; Chicago: suicide mortality, primary and secondary syphilis in 2005), which makes the percentage difference negative and changes the interpretation of the percentage difference.

There may be a bias in the 2005 US estimate regarding the proportion of women without prenatal care in the first trimester. This is because of the fact that the method for reporting this measure has been revised and in 2005 there were only 37 states reporting this measure consistent with 1990 methods. It is not possible to determine the extent to which the reduction in states reporting may bias the findings in 2005 and, thus, affect the change in disparity over time for the United States.

As mentioned in the Methods section, the method for calculating infant mortality differed between Chicago and the United States. The Chicago analysis utilized unlinked files, whereas the US analysis utilized linked files. Because our analysis is focused on measuring relative differences over time within each location, the use of differing methods for different geographic areas is unlikely to affect our findings for this measure.

Sexually transmitted disease reporting also tends to be incomplete and biased.<sup>56</sup> Generally, cases among patients attending public sector clinics are more likely to be reported, and the population attending public sector clinics often differs in its racial/ethnic distribution from that of private clinics. Consequently, it is likely that rates used for primary and secondary syphilis are biased toward a smaller rate for the non-Hispanic White population. However, our main purpose in this analysis was to examine trends over time, and we have no reason to believe that this bias would change over the time period for our analysis, which makes it unlikely to affect our conclusions regarding trends in disparity over time for this measure.

This analysis is also limited in scope because we did not examine trends for other racial groups or Hispanic ethnicity. In Chicago it is not possible to examine trends for racial groups other than Black and White because of the small size of these other populations, which

leads to unreliable estimates. As in the previous analysis conducted by Margellos et al., we did not examine trends for persons of Hispanic ethnicity. The reasons for this exclusion are explained in detail in that paper.<sup>6</sup>

## Conclusions

Our analysis suggests that after 15 years of time and effort devoted to reducing and eliminating disparities at both the national and local level, disparities persist and are in some cases widening. We view this paper as a wake-up call for us to mobilize ourselves to produce a genuine movement and strategy for reducing disparities. It is clear that if we do nothing, we will be discussing similar failures 15 and even 50 years from now. ■

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## Contributors

J.M. Orsi conducted the analysis and led the writing of the article. H. Margellos-Anast and S. Whitman originated the analysis and contributed to the writing of the article. All authors reviewed drafts of the article and interpreted findings.

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## Human Participant Protection

No institutional review board approval was needed for this study because it utilized publicly available deidentified vital statistics data.

## References

1. *Black & Minority Health. Report of the Secretary's Task Force*, Vol 1, Executive Summary. Washington DC: Department of Health and Human Services; 1985.
2. *Healthy People 2010: With Understanding and Improving Health and Objectives for Improving Health*. Washington, DC: Department of Health and Human Services; 2000.
3. *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*. Washington: DC: Department of Health and Human Services; 1991. DHHS publication PHS 91-50212.
4. Silva A, Whitman S, Margellos H, Ansell D. Evaluating Chicago's success in reaching the Healthy People 2000 goal of reducing health disparities. *Public Health Rep*. 2001;116(5):484-494.
5. Keppel KG, Percy JN, Wagener DK. Trends in racial and ethnic-specific rates for the health status indicators: United States, 1990-98. *Healthy People 2000 Stat Notes*. 2002;(23):1-16.
6. Margellos H, Silva A, Whitman S. Comparison of health status indicators in Chicago: are Black-White disparities worsening? *Am J Public Health*. 2004;94(1):116-121.
7. *International Classification of Diseases, Tenth Revision*. Geneva, Switzerland: World Health Organization; 1992.
8. *International Classification of Diseases, Ninth Revision*. Geneva, Switzerland: World Health Organization; 1980.
9. Centers for Disease Control and Prevention. *A Guide to State Implementation of ICD-10 for Mortality Part II: Applying Comparability Ratios*. Washington, DC: National Center for Health Statistics; 2000.
10. US Census Bureau. Decennial Census. Available at: <http://www.census.gov>. Accessed July 22, 2008.
11. US Census Bureau. *American Community Survey: 2005*. Available at: <http://www.census.gov/acs/www/index.html>. Accessed July 24, 2008.
12. Keppel KG, Percy JN, Klein RJ. Measuring progress in Healthy People 2010. *Healthy People 2010 Stat Notes*. 2004(25):1-16.
13. Ayanian JZ. Determinants of racial and ethnic disparities in surgical care. *World J Surg*. 2008;32(4):509-515.
14. Freeman HP. The meaning of race in science—considerations for cancer research: concerns of special populations in the National Cancer Program. *Cancer*. 1998;82(1):219-225.
15. Epstein AM, Ayanian JZ, Keogh JH, et al. Racial disparities in access to renal transplantation—clinically appropriate or due to underuse or overuse? *N Engl J Med*. 2000;343(21):1537-1544, 2 p preceding 1537.
16. Williams DR. Race, socioeconomic status, and health. The added effects of racism and discrimination. *Ann N Y Acad Sci*. 1999;896:173-188.
17. Geronimus AT, Bound J, Waidmann TA. Poverty, time, and place: variation in excess mortality across selected US populations, 1980-1990. *J Epidemiol Community Health*. 1999;53(6):325-334.
18. Keppel KG. Ten largest racial and ethnic health disparities in the United States based on Healthy People 2010 Objectives. *Am J Epidemiol*. 2007;166(1):97-103.
19. Levine RS, Foster JE, Fullilove RE, et al. Black-white inequalities in mortality and life expectancy, 1933-1999: implications for Healthy People 2010. *Public Health Rep*. 2001;116(5):474-483.
20. Brenner MH. Political economy and health. In: Amick BC, Levine S, Tarlov AR, Chapman Walsh D, eds. *Society and Health*. New York, NY: Oxford University Press; 1995.
21. Burgard SA, Brand JE, House JS. Toward a better estimation of the effect of job loss on health. *J Health Soc Behav*. 2007;48(4):369-384.
22. Rabin RC. Losing job may be hazardous to health. *New York Times*. May 9, 2009;National:1.
23. Hirschman J, Whitman S, Ansell D. The black-white disparity in breast cancer mortality: the example of Chicago. *Cancer Causes Control*. 2007;18(3):323-333.
24. Lillie-Blanton M, Parsons PE, Gayle H, Dievler A. Racial differences in health: not just black and white, but shades of gray. *Annu Rev Public Health*. 1996;17:411-448.
25. Lu MC, Halfon N. Racial and ethnic disparities in birth outcomes: a life-course perspective. *Matern Child Health J*. 2003;7(1):13-30.
26. Krieger N, Sidney S. Racial discrimination and blood pressure: the CARDIA Study of young black and white adults. *Am J Public Health*. 1996;86(10):1370-1378.
27. Cooper RS, Kennelly JF, Durazo-Arvizu R, Oh HJ, Kaplan G, Lynch J. Relationship between premature mortality and socioeconomic factors in black and white populations of US metropolitan areas. *Public Health Rep*. 2001;116(5):464-473.
28. Fullilove MT. *Root Shock: How Tearing Up City Neighborhoods Hurts America and What We Can Do About It*. New York, NY: Ballantine Books; 2004.
29. Williams DR, Collins C. US socioeconomic and racial differences in health: patterns and explanations. *Annu Rev Sociol*. 1995;21:349-386.
30. Skinner J, Chandra A, Staiger D, Lee J, McClellan M. Mortality after acute myocardial infarction in hospitals that disproportionately treat black patients. *Circulation*. 2005;112(17):2634-2641.
31. Morales LS, Staiger D, Horbar JD, et al. Mortality among very low-birthweight infants in hospitals serving minority populations. *Am J Public Health*. 2005;95(12):2206-2212.
32. Collins C, Williams DR. Segregation and mortality: the deadly effects of racism? *Sociol Forum*. 1999;14(3):495-523.
33. Massey D, Denton N. *American Apartheid: Segregation and the Making of the Underclass*. Cambridge, MA: Harvard University Press; 1993.
34. Ritter J. Healthcare racial gap widens here. *Chicago Sun Times*. January 16, 2004;Metro.
35. Graham J. Black-white health gap. *Chicago Tribune*. January 16, 2004;Metro.
36. Thomas M. Black women here twice as likely to die of breast cancer. *Chicago Sun Times*. October 22, 2008;Metro:1.
37. Shelton DL. New breast cancer data show the gap widening between blacks, whites here. *Chicago Tribune*. October 22, 2008;Section 1-Health:1.
38. Chicago Metropolitan Breast Cancer Task Force. *Improving Quality and Reducing Disparities in Breast Cancer Mortality in Metropolitan Chicago*. October 2007. Available at: [http://www.suhichicago.org/files/publications/Task%20Force%20Rpt\\_Oct%202007\\_FINAL.pdf](http://www.suhichicago.org/files/publications/Task%20Force%20Rpt_Oct%202007_FINAL.pdf). Accessed March 9, 2009.
39. Chicago Metropolitan Breast Cancer Task Force Website. Available at: <http://www.chicagobreastcancer.org>. Accessed March 9, 2009.
40. Phelan JC, Link BG. Controlling disease and creating disparities: a fundamental cause perspective. *J Gerontol B Psychol Sci Soc Sci*. 2005;60(Spec no. 2):27-33.

41. McKeown M. *The Role of Medicine: Dream, Mirage, or Nemesis?* London, England: Nuffield Provincials Hospital Trust; 1976.
42. Susser M, Watson W, eds. *Sociology in Medicine*. 2nd ed. London, New York; Oxford University Press; 1971.
43. Williams DR, Collins C. Racial residential segregation: a fundamental cause of racial disparities in health. *Public Health Rep*. 2001;116(5):404–416.
44. Kozol J. *The Shame of the Nation: The Restoration of Apartheid Schooling in America*. New York, NY: Crown Publishers; 2005.
45. Smedley B, Stith A, Nelson A, eds. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Washington, DC: The National Academies Press; 2002.
46. Epstein AM, Ayanian JZ. Racial disparities in medical care. *N Engl J Med*. 2001;344(19):1471–1473.
47. Cohen HW, Northridge ME. Getting political: racism and urban health. *Am J Public Health*. 2008;98(9 Suppl):S17–S19.
48. Whitman S. Racial disparities in health: taking it personally. *Public Health Rep*. 2001;116(5):387–389.
49. Mino M, Deren S. *Disparities in HIV Prevention Services, Infection Rates and Mortality: A Comparison of Drug Users in Puerto Rico and New York*. National Development and Research Institutes Inc and the Universidad del Caribe; October 2004. Available at: [http://cduhr.ndri.org/docs/reports/ARIBBA\\_NY\\_PR\\_%20Disparities.pdf](http://cduhr.ndri.org/docs/reports/ARIBBA_NY_PR_%20Disparities.pdf). Accessed March 11, 2009.
50. Karnick P, Margellos-Anast H, Seals G, Whitman S, Aljadeff G, Johnson D. The pediatric asthma intervention: a comprehensive cost-effective approach to asthma management in a disadvantaged inner-city community. *J Asthma*. 2007;44(1):39–44.
51. Sisters Network Inc.: A National African-American Breast Cancer Survivorship Organization. Web site. Available at: <http://www.sistersnetworkinc.org>. Accessed May 4, 2009.
52. Percy JN, Keppel KG. A summary measure of health disparity. *Public Health Rep*. 2002;117(3):273–280.
53. Keppel K, Pamuk E, Lynch J, et al. Methodological issues in measuring health disparities. *Vital Health Stat 2*. 2005;(141):1–16.
54. Drewette-Card RJ, Landen MG. The disparity change score: a new methodology to examine health disparities in New Mexico. *J Public Health Manag Pract*. 2005;11(6):484–492.
55. Krieger N, Chen JT, Waterman PD, Rehkopf DH, Subramanian SV. Painting a truer picture of US socioeconomic and racial/ethnic health inequalities: the Public Health Disparities Geocoding Project. *Am J Public Health*. 2005;95(2):312–323.
56. Centers for Disease Control and Prevention. Primary and secondary syphilis—United States, 2000–2001. *MMWR Morb Mortal Wkly Rep*. 2002;51(43):971–973.