A Tale of Three Cities: Racial and Ethnic Disparities in Premature Mortality in the District of Columbia, 2005

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INTRODUCTION

When mortality data reveal racial or ethnic disparities, they are particularly poignant because how and when we die reflects the endpoint of a longer process, namely how we live. Death has thus been called "the ultimate sentinel event" because it can alert decision-makers that something is wrong with the body politic. In the health field, mortality data can express specific vulnerabilities; reflect socio-economic, environmental and other risk factors; and indicate service gaps. Collectively, mortality rates have been called "the quantification of a population's collective tragedy."[1]

Many nations, states, counties and cities use crude mortality rates to rank their major health issues, often allocating resources accordingly. But there are other indicators that better capture the relative priority of health problems, one of these being *years of potential life lost* (YPLL), which measures premature mortality. YPLL reflects the number of useful years of life that are not available to a population due to early death.[2]

This indicator has a long history[3] and has been subject to some variations. It has been used to examine premature mortality in different countries (including the United States,[4] Italy,[5] Ireland,[6] Israel[7] and Canada,[8] among others) and states

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[1] Paul H. Wise, Confronting Racial Disparities in Infant Mortality: Reconciling Science and Politics. *American Journal of Preventive Medicine* Supplement to vol. 9 (6) November/December 1993: 7.
[2] United Health Foundation, *Health Rankings --- 2007 Edition. A Call to Action for People and Their Communities*: 20.
[3] William Petty (1623-1687), a pioneer in vital statistics and economics, conceived of such a measure in his *Political Arithmetic* (1687). John Last, Ed. *A Dictionary of Epidemiology* (New York: Oxford University Press, 1983): 81.
[4] Centers for Disease Control, Years of Potential Life Lost before Age 65 – United States, 1990 and 1991. *Morbidity and Mortality Weekly Report* 42 (1993): 251-253.
[5] Massimo Arca et al. Years of Potential Life Lost (YPLL) before age 65 in Italy. *American J of Public Health* 78 (9). 1988: 1202-1205.
[6] E. O'Shea, Social gradients in years of potential life lost in Ireland. *European J of Public Health* 13 (4). December 2003: 327-33.

(e.g., North Carolina[9]). It has also been used in assessing the impact of deaths associated with specific causes or risk factors (e.g., smoking,[10] automobile accidents[11] and the consumption of alcohol[12]). This article focuses on the District of Columbia, which is of particular interest because of its political importance and its ethnic and racial diversity.

METHODS

The indicator YPLL is defined here as the number of years of life lost by persons before reaching age 70. The calculation of YPLL for a particular cause involves subtracting each deceased person's age from 70. These differences – the "years lost" – are added for all deceased people in that category. These data are then grouped or broken down by the demographic variables of interest (e.g., sex, race/ethnicity and jurisdiction).[13]

Some researchers exclude infant deaths in calculating YPLL. For example, Romeder and McWhinnie argue that such deaths are most often due to causes specific to this early period of life and often have a different etiology than later deaths. Moreover,

> each infant death would account for almost 70 years, giving a weight double that of a death between ages 30 and 40. This appears to be an overestimation of the value accepted by society for such a loss in the light that a very early death is often replaced by another birth.[14]

The U.S. Centers for Disease Control and Prevention (CDC), however, includes these early deaths in their computations of YPLL. This is in keeping with their emphasis on prevention, which includes averting infant deaths. As causes of early deaths such as sudden infant death syndrome and automobile and other injuries have become more preventable, it is important that these deaths be duly

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7 ED Richter, Potential-Years-of-Life- Lost from Motor Vehicle Crashes in Israel: An Epidemiological Analysis. *International Journal of Epidemiology* 1979; 8: 383-388.
8 JM Romeder and JR McWhinnie, Potential Years of Life Lost Between the Ages of 1 and 70: An Indicator of Premature Mortality for Health Planning. *International Journal of Epidemiology* 6 (1977): 143-151.
9 Daniel Rosenberg, *SCHS Studies* 130 (January 2002). www.schs.state.nc.us/SCHS/pubs.
10 Annual Smoking-Attributable Mortality, Years of Potential Life Lost, and Productivity Losses – United States, 1997-2001. *Morbidity and Mortality Weekly Reports*. June 30, 2005. http://ncadi.samhsa.gov/govpubs/mmwr/vol54/mm5424aI.aspx
11 Richter, op. cit.
12 Alcohol-Attributable Deaths and Years of Potential Life Lost – United States, 2001. *Morbidity and Mortality Weekly Report* 2004; 53: 866-870.
13 While most analyses use five-year age groups and the midpoint for each group to compute YPLL, the CDC uses individual deaths, subtracting the actual age at death from whatever cut-off point is used. See http://www.cdc.gov/ncipc/wisqars/fatal/help/helpfile.htm
14 Romeder and McWhinnie, op. cit.: 148.

included in indicators used in epidemiological surveillance. We have therefore included these early deaths in our analysis.

Another methodological issue concerns the appropriate cut-off point for defining premature death. Here, we have followed Romeder and McWhinnie, who use the cut-off age of 70. They argue that using an older age (e.g., 75 or 85, which are sometimes used) includes deaths in which the underlying cause is difficult to determine. At the same time, a younger cut-off age (e.g., 65) excludes a significant proportion of the population that is still productive.[15] Because the cut-off age can vary and is basically arbitrary, current CDC databases provide YPLL using different cut-off points ranging between 65 and 85.[16] Our choice of 70 is therefore well within the parameters established in the literature. Deaths before this age are therefore considered premature for our purposes.

The CDC's Web-based Injury Statistics Query and Reporting System (better known as WISQARS) provides data broken down by jurisdiction, year, cause and race/ethnicity. This database also allows users to choose from a menu of indicators, and we have used age-adjusted YPLL rates. Certain causes of death are more prevalent among particular age groups, and age adjustment allows us to compare rates without concern that differences in those rates are caused by variations in the age distributions of the populations being compared. We examined the District of Columbia data and data for the United States as a whole for the year 2005. In focusing on D.C., we looked at both overall data as well as the YPLL for both sexes and three population subgroups: whites, blacks and Hispanics. Because Hispanics can be of any race and we wanted to avoid any overlap among groups, the categories of "white" and "black" consistently refer to non-Hispanic whites and non-Hispanic blacks, respectively. While there are other ethnic groups living in D.C., these are too small to yield meaningful data and reliable rates.

RESULTS

Tables 1 and 3 that follow show the YPLL rates for each group and how these are distributed by cause. The percentage shows the relative importance of the causes *within* each group, while the age-adjusted YPLL rates and the rate ratios allow comparisons *between* groups. As in the WISQARS database, the rates are expressed in terms of YPLL per 100,000 population.

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15 Romeder and McWhinnie, op. cit.: 147.

16 Centers for Disease and Prevention, National Center for Injury Prevention and Control. WISQARS YPLL Reports, 1999-2005.

Overall YPLL

Table 1 summarizes the YPLL rates for the 10 principal causes of death for the District of Columbia and the United States as a whole.

Table 1. ***Rate of Years of Potential Life Lost (YPLL) Before Age 70 per 100,000 Population, District of Columbia and the United States: 2005, All Races, Both Sexes, All Deaths and Selected Causes***

Cause of Death	District of Columbia		United States		Rate Ratio D.C.: U.S.
	Age-Adjusted YPLL	Percent of Total YPLL	Age-Adjusted YPLL	Percent of Total YPLL	
All Causes	9,714.6	100.0	5,663.6	100.0	1.7
Cancer	1,250.1	12.9	1,028.4	18.2	1.2
Homicide	1,209.5	12.5	253.5	4.5	4.8
Heart Disease	1,130.0	11.6	757.9	13.4	1.5
Perinatal Period	985.0	10.1	381.4	6.7	2.6
HIV	906.0	9.3	*	*	*
Accidents	765.5	7.9	1,008.6	17.8	0.8
Suicide	*	*	304.5	5.4	*
Congenital Anomalies	282.4	2.9	198.5	3.5	1.4
Stroke	222.6	2.3	130.2	2.3	1.7
Diabetes	189.0	1.9	122.0	2.2	1.6
Liver Disease	147.0	1.5	117.2	2.1	1.3

* Data not included because cause of death is not among the top 10 for YPLL for that population. *Source for all tables:* Office of Statistics and Programming, National Center for Injury Prevention and Control, National Center for Health Statistics (NCHS) Vital Statistics System, CDC.

As Table 1 indicates, cancer is the principal cause for YPLL in both the District of Columbia and the United States as a whole. But the relative importance of this cause of premature death varies significantly between the two populations. While the YPLL rate for cancer is higher in the District, cancer accounts for a significantly larger proportion of all YPLL for the nation as a whole. The table also indicates the importance of homicide in premature losses in the District. This cause ranks second in D.C. and accounts for one in eight years of potential life lost. Nationally, homicide ranks 6th and accounts for fewer than one in 20 of the total YPLL. These differences are highlighted in the rate ratio for homicide, which is 4.8-fold higher in the District. As can be calculated from Table 1, the six principal causes of premature mortality in the District comprise 64.3 percent of total YPLL; the top six causes nationally account for 66.0 percent of total YPLL.

In both cases, there is a significant decrease between the top six causes and the remaining causes.

Three other causes for which the D.C. experience is different from the national one are HIV, accidents and suicide. HIV is the 5th cause of YPLL in the District but does not even rank among the top 10 causes of premature loss nationally.[17] Accidents – which include falls, motor vehicle accidents, occupational accidents, and deaths by unintentional fire or poisoning – rank 2nd nationally but only 6th in D.C. This is partly explained by the District's reliance on public transportation, which reduces the number of persons at risk for automobile accidents, one of the major causes in this category. And while suicide ranks 5th nationally, it does not place among the top 10 causes of YPLL in the nation's capital.

Premature Mortality by Sex

Premature mortality is predominantly a male phenomenon. Although men account for less than half of the total population both within the District of Columbia and nationally, they comprise fully 64.3 percent of all YPLL due to all causes in D.C. and 63.1 percent nationally. When the D.C. data are broken down by specific cause, the magnitude of the differences between the sexes is further highlighted.

As seen in Table 2, the rate of total YPLL from all causes in D.C. is almost twice as high among males as among females. Indeed, among the 10 major causes of death, there is only one – congenital anomalies – in which females are at a slightly greater risk for premature death. This cause is defined as defects occurring from birth and most often reflect development *in utero*. For most of the remaining causes, male rates of YPLL are between 1.5 and 2.0 times as high as those for women. Homicides constitute a particularly dramatic case of gender-based differences in premature mortality, the YPLL rate for men being almost 10-fold that for women.

When the sex-specific ratios for D.C. are compared with those for the United States, the differences for all causes tend to be smaller for the country as a whole (1.9 for D.C. vs. 1.7 for the U.S.). But this lower U.S. ratio can be attributed largely to the differential in YPLL due to homicides between the two populations, the 9.8 rate ratio between sexes in D.C. being reduced to a 4-fold difference for the nation.

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17 Between 1996 and 1997, HIV declined abruptly as a major cause of death at the national level. In 1996, HIV was the 8th leading cause of death. A year later, it had declined 47 percent, and ranked 14th among the leading causes of death. SJ Ventura, RN Anderson, BL Smith. Births and deaths: Preliminary data for 1997. National Vital Statistics Reports 47 (4). Hyattsville, MD: National Center for Health Statistics, CDC. 1998.

Two other differences are evident from Table 2. First, the YPLL difference by sex for accidents is higher nationally than it is for D.C. And, second, while suicide is not one of the major causes of death in D.C., the sex differential for this cause of YPLL is quite marked for the U.S. as a whole, the YPLL rate for men being 3.8 times higher than that for women.

Table 2. *Rate of Years of Potential Life Lost (YPLL) Before Age 70 per 100,000, District of Columbia and the United States: 2005, All Races, Major Causes of Death, By Sex*

Cause of Death	Age-Adjusted YPLL Rate per 100,000 Population					
	District of Columbia			United States		
	Male (M)	Female (F)	M:F	Male (M)	Female (F)	M:F
All Causes	12,868.0	6,830.8	1.9	7,172.0	4,159.6	1.7
Cancer	1,446.4	1,082.0	1.3	1,075.3	986.0	1.1
Perinatal Period	1,154.4	807.3	1.4	419.7	341.4	1.2
HIV	1,088.2	735.5	1.5	164.7	*	*
Suicide	*	*	*	480.1	126.2	3.8
Heart Disease	1,631.7	685.8	2.4	1,075.8	452.0	2.4
Accidents	1,024.5	535.1	1.9	1,430.5	577.9	2.5
Congenital Anomalies	268.7	294.9	0.9	208.3	188.2	1.1
Homicide	2,275.0	231.7	9.8	401.9	99.6	4.0
Stroke	271.4	179.2	1.5	*	117.9	*
Diabetes	241.7	140.8	1.7	148.4	96.6	1.5
Liver Disease	236.5	*	*	166.2	*	*
Septicemia	*	96.8	*	*	*	*
Chronic Lower Respiratory Disease	*	*	*	*	94.7	*

* Data not included because cause of death is not among the top 10 for YPLL for that population.

Premature Mortality by Race/Ethnicity

During the past 25 years there has been growing recognition that the United States suffers from wide racial and ethnic disparities in terms of both health status and access to care. The publication of the Department of Health and Human Services *Report of the Secretary's Task Force on Black and Minority Health* in 1985 documented many of these disparities, and led to a new focus on the health of minorities. This has in turn resulted in greater surveillance and in better and more complete data on the health of specific groups. It has also

prompted more interventions to improve the health of those segments of the population that are at particular risk for ill health and injuries.

Nevertheless, recent data indicate that racial disparities are still extremely large and pervasive across different indicators of health status. And these have not narrowed over time.[18] Indeed, the co-existence of an expanded capacity to control disease with the persistence of inequalities appears to have exacerbated racial and socio-economic disparities in health by tilting these new capabilities towards those that are already better off. New technologies and treatments, while reducing disease, can ironically widen socio-economic disparities in health. In the words of Phelan and Link, "When we develop the ability to control disease and death, the benefits of this new-found ability are distributed according to resources of knowledge, money, power, prestige, and beneficial social connections."[19]

Researchers have therefore focused on "fundamental causes" of disparities in health, looking at the social determinants of health and disease. These include differences in natural capital (environmental resources), human capital (education), material capital (occupation, employment, income) and social capital (social support and community empowerment). These "capitals" are seldom equitably distributed and tend to cluster or overlap. Because advantages often feed on each other, those who are better endowed with respect to one also tend to be better off with respect to the others. Understanding the pathways through which these factors interact to further or thwart better health has therefore become a major focus in addressing existing disparities.

The growing literature on disparities has shown that where you stand in the social hierarchy is intimately related to your health and life expectancy. And these social distinctions operate even for people above a threshold of material well-being, as Marmot has documented, a phenomenon that he has called "the status syndrome." His studies have shown that "autonomy – how much control you have over your life – and the opportunities you have for full social engagement and participation are crucial for health, well-being, and longevity."[20] Conversely, in societies in which prejudice, poverty, powerlessness and ill health are self-reinforcing, segments of the population face multiple barriers to break out of the cycle and overcome their cumulative disadvantages.

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18 David R. Williams and Chiquita Collins, Racial Residential Segregation: A Fundamental Cause of Racial Disparities in Health. *Public Health Reports*, September-October 2001, Vol. 116: 405.
19 Jo C. Phelan and Bruce G. Link, Controlling Disease and Creating Disparities: A Fundamental Cause Perspective. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 60 (2005): S27-S33.
20 Michael Marmot, *The Status Syndrome: How Social Standing Affects Our Health and Longevity.* New York: Times Books, Henry Holt and Co., 2004: 2.

As the nation's political capital and seat of government, the District of Columbia reflects and refracts much of what is happening in the nation as a whole. At the same time, the District has a very particular economy and demographic composition that make it distinctive, and that amplify trends that are less salient elsewhere. D.C. has the following characteristics:[21]

- The population of the District is predominantly black. In 2006, blacks constituted 56.5 percent of the total number of inhabitants in the nation's capital, while accounting for 12.8 percent of the population of the United States. Conversely, non-Hispanic whites comprised 31.7 percent of the District's inhabitants, in contrast to 66.4 percent for the U.S. as a whole. Hispanics are under-represented in D.C., where they account for 8.2 percent of the population, compared to 14.8 percent for the U.S. as a whole.

- District neighborhoods are characterized by racial segregation. Although no longer legitimized by law, residential segregation by race is a reality in many American cities, including the nation's capital. As a result, blacks constitute an overwhelming majority of the population in certain wards. In Wards 7 and 8, blacks account for 96.9 and 91.8 percent of the total population, respectively.[22] Because race and poverty tend to be associated in the U.S., these wards are also the ones with the lowest family incomes in the city.[23] Not unexpectedly, they also have the worst health indicators. Ward 7, for example, has the highest rates of six out of the nine adult chronic conditions examined in a recent health assessment of the District.[24] Among the other three conditions, Ward 8 had the worst indices for two of them. And these two wards had the highest age-adjusted mortality rates for all of the eight causes of premature mortality among those 18-64 years old.[25] Because of these phenomena, Williams and Collins have argued that "racial residential segregation is the cornerstone on which black-white disparities in health status have been built in the U.S. Segregation… shapes socioeconomic conditions for blacks not only at the individual and household levels but also at the neighborhood and community levels." [26]

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[21] All data are for 2006. U.S. Census Bureau, State and County QuickFacts. District of Columbia. http://quickfacts.census.gov/qfd/states/11000.html

[22] Nicole Lurie et al. RAND Health Working Paper: Assessing Health and Health Care in the District of Columbia. January 2008: x.

[23] Ibid.

[24] Lurie et al, op. cit.: xvi.

[25] Ibid.

[26] David R. Williams and Chiquita Collins, Racial Residential Segregation: A fundamental Cause of Racial Disparities in Health. *Public Health Reports.* September-October 2001, Vol. 116: 405.

- Like blacks, although to a lesser extent, Hispanics tend to cluster geographically; in 2000, one ward (Ward 1) had a population that was 23.4 percent Hispanic.[27] Among the remaining seven wards, the Hispanic share of the population varied between 0.9 percent and 12.8 percent.[28] This tendency towards concentration and exclusion has health implications. While ethnic enclaves created by such residential patterns once allowed newcomers to adapt gradually, providing them the social supports needed to navigate a new language and culture, the resulting longer-term residential segregation can also isolate minorities, trapping them in neighborhoods in which jobs are scarce and economic mobility is limited. This trend may have increased with gentrification, although this process may also have dispersed the population once living in transitional neighborhoods.

- D.C. has a smaller proportion of persons under 5 years of age (6.0 percent vs. 6.8 percent) and under age 18 (19.8 percent vs. 24.6 percent).[29]

- The population of the District has a significantly higher level of education that the U.S.: 39.1 percent of D.C. inhabitants have a bachelor's degree or higher, compared to 24.4 percent for the country as whole.[30]

- Poverty and socio-economic disparities are masked by higher median household and per capital incomes. While the District's individuals and households are more affluent than the country as a whole (median household income is $46,211 in the District and $44,334 in the U.S.; per capita income is $28,659 in D.C. and $21,587 in the U.S.), D.C. has a significantly higher proportion of its population falling under the poverty level: 18.3 percent, compared to 12.7 percent for the U.S.[31]

It is against this backdrop that the data on YPLL should be examined. Table 3 presents the proportion of YPLL attributed to the five principal causes of potential loss, by cause and demographic subgroup.

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27 Lurie, et al. op. cit.: x.
28 Ibid.
29 All data are for 2006. U.S. Census Bureau, State & County QuickFacts. District of Columbia. http://quickfacts.census.gov/qfd/states/11000.html
30 Ibid.
31 Ibid.

Table 3. ***Proportion of Years of Potential Life Lost (YPLL) Before Age 70, District of Columbia and United States: 2005, Blacks, Whites, Hispanics, Both Sexes, 5 Principal Causes of Death***

Cause of Death	Whites (%)		Blacks (%)		Hispanics (%)	
	D.C.	U.S.	D.C.	U.S.	D.C.	U.S.
Homicide	*	*	**15.7**	9.5	10.8	6.9
Cancer	**18.7**	19.5	11.8	15.2	12.3	15.6
Heart Disease	6.6	13.4	11.9	**15.5**	*	10.5
HIV	6.3	*	10.5	*	*	*
Accidents	13.9	**20.4**	*	10.7	**12.4**	**19.2**
Perinatal Period	14.8	5.5	8.9	8.5	7.3	7.2
Congenital Anomalies	*	3.5	*	*	11.0	*
TOTAL	60.3	62.3	58.8	59.4	53.8	59.4

* Data not included because cause of death is not among the top five for YPLL for that population. Causes with the highest share are indicated in bold for each group.

As shown in Table 3, the relative importance of the main causes of YPLL varies for each of the District's subgroups, each group having a different top cause for YPLL (indicated in bold). While homicide represents the main cause of potential life lost among blacks and ranks 4th among Hispanics, this cause does not even appear among the top five for whites. Homicides, which are associated with the availability of handguns, prevalence of felony-level crimes, and drug use, are primarily confined to specific circumstances and neighborhoods, largely sparing others. Furthermore, in the U.S. homicides rates are directly correlated with income inequalities: among states, the higher the income inequality, the higher the homicide rate.[32] This phenomenon has been found within the city of Chicago and in the Canadian provinces and may also be occurring in D.C. And because assailants tend to be similar to their victims, the pattern has a differential impact on certain communities.

In the District, cancer assumes a higher priority as a cause of YPLL for whites than for the other two groups. This, however, does not mean that the rate for cancer is higher for whites;[33] rather, this particular cause of death represents a larger share of YPLL for the white population. Among Hispanics, accidents account for the largest proportion of YPLL in D.C. as well as nationally. And congenital anomalies, ranking 3rd in D.C., are a source of major loss for

32 M. Daly, M. Wilson and S Vasdev. Income Inequality and Homicide Rates in the United States and Canada. *Canadian Journal of Criminology* 43, 2001: 219-236, cited in Marmot, op. cit.: 100-101.

33 Indeed, as is seen in Table 5, the YPLL rate for cancer among blacks is almost 3-fold that for whites.

Hispanics, yet this cause does not rank among the top five for whites or blacks. Any attempt at designing effective interventions in the District of Columbia will therefore have to take these differences into account.

Table 3 also reflects the fact that, even within given ethnic groups, the major causes of premature death differ when the District is compared to the nation in general. Thus, among whites, accidents rank 1st nationally but 3rd in D.C. And, among blacks, heart disease is the principal cause of YPLL nationally, but ranks 2nd in the District. Among Hispanics, however, accidents constitute the major cause of premature loss both in the U.S. and in D.C. At least part of the difference can be attributed to deaths on the job. Many Latinos, particularly recent immigrants, work at high-risk jobs in the construction and service sectors. Their risks are compounded by language barriers that hinder understanding of the job and its risks, and limit access to safety precautions.[34]

Table 4 summarizes age-adjusted YPLL rates by major cause of death and subgroup. The rates for all causes show how D.C. differs from the nation as a whole in terms of premature mortality by race/ethnicity. While survivability as measured by YPLL is more favorable in the District than nationally for whites and Hispanics, it is significantly worse for blacks. The breakdown by cause indicates that blacks in the District are at higher risk for all major causes of death than the U.S. black population as a whole. This of course accentuates the existing racial/ethnic disparities. As a result, the District of Columbia is not a microcosm of the nation as a whole, but rather an unfortunate example of how racial and ethnic differences in premature mortality are magnified in the nation's capital.

34 Latinos dying on job at higher rates than others. *Los Angeles Times,* June 06, 2008. http://articles.latimes.com/2008/jun/06/business/fi-latino6

Table 4. ***Rate of Age-Adjusted Years of Potential (YPLL) Before Age 70, District of Columbia and United States: 2005, Blacks, Whites, Hispanics, Both Sexes, 10 Principal Causes of Death***

Cause of Death	Age-adjusted Rate of YPLL per 100,000 Population, by Group					
	White		Black		Hispanic	
	D.C.	U.S.	D.C.	U.S.	D.C.	U.S.
All Causes	3,163.1	5,249.6	14,466.0	9,661.6	3,438.7	4,559.9
Cancer	592.1	1,024.8	1,704.3	1,472.9	422.4	709.4
Accidents	440.3	1,069.5	1,042.4	1,030.7	426.7	873.5
Perinatal Period	468.5	288.4	1,282.8	821.7	251.4	327.9
Heart Disease	208.1	705.4	1,720.9	1,498.1	*	480.1
HIV	203.4	*	1,517.3	525.9	123.7	120.0
Congenital Anomalies	136.8	184.6	328.7	240.1	377.2	206.7
Suicide	120.6	364.9	*	178.1	*	171.8
Homicide	52.4	*	2,275.9	916.0	372.7	313.9
Liver Disease	*	112.8	193.0	*	158.1	161.4
Stroke	54.9	101.2	343.7	320.2	*	127.8
Diabetes	*	102.4	300.3	269.8	126.9	*
Benign Neoplasms	69.8	*	*	*	*	*
Chronic Lower Respiratory Disease	*	104.0	*	*	138.1	*
Influenza & Pneumonia	*	*	*	*	135.5	*

* Data not included because cause of death is not among the top 10 for YPLL for that population.

As shown in Table 4, compared to the other two groups, blacks in D.C. have higher rates of YPLL for all but one cause of the top 10 causes of YPLL overall, the exception being congenital anomalies, for which Hispanics suffer the largest losses.

Overall, the YPLL rate ratio between blacks and whites, and between blacks and Hispanics is more than 4-fold in D.C., as indicated in Table 5. For the U.S. as a whole, the corresponding disparities are still high, but considerably more attenuated, with YPLL for all causes being approximately twice as high for blacks as for each of the two other groups nationally.

Table 5. ***Ratio of Age-Adjusted Years of Potential (YPLL) Rates for Blacks, Whites, and Hispanics Compared to Each Other, District of Columbia and United States: 2005, Major Causes of Death, Both Sexes***

Cause of Death	YPLL Rate Ratios					
	Black: White		Hispanic: White		Black: Hispanic	
	D.C.	U.S.	D.C.	U.S.	D.C.	U.S.
All Causes	4.6	1.8	1.1	0.9	4.2	2.1
Homicide	43.4	*	7.1	*	6.1	2.9
Cancer	2.9	1.5	0.7	0.7	4.0	2.1
Heart Disease	8.3	2.1	*	0.7	*	3.1
HIV	7.5	*	0.6	*	12.3	4.4
Perinatal Period	2.7	2.8	0.5	1.1	5.1	2.5
Accidents	2.4	1.0	1.0	0.8	2.4	1.2
Congenital Anomalies	2.4	1.3	2.8	1.1	0.9	1.2
Stroke	6.3	3.2	*	1.3	*	2.5
Diabetes	*	2.6	*	*	2.4	*
Liver Disease	*	*	*	1.4	1.2	*
Suicide	*	0.5	*	0.5	*	1.0

* Data not included because cause of death is not among the top 10 for YPLL for that population.

Cause-specific data highlight the extent to which certain conditions are responsible for the differences. While blacks' rates of YPLL are higher for all causes, the disparity in rates of YPLL between blacks and whites in D.C. is particularly dramatic for deaths due to homicide. The relative risk of blacks losing years of potential life to this violent cause of death is more than 43-fold that for whites. Blacks are also at very high risk for premature losses as a result of heart disease, HIV and stroke, the difference being more than 6-fold for each of these causes. Nationally, the black: white ratio of YPLL for all causes is less than half what it is in D.C.; it actually approaches parity with respect to certain causes, such as accidents, congenital anomalies, and suicide.

In the District, overall disparities between Hispanics and whites for all causes are almost negligible. Nevertheless, there are marked differences between the two groups in terms of losses due to specific causes. As is the case with blacks, although to a lesser extent, years lost due to homicide are much higher for Hispanics than for their white counterparts, with a more than 7-fold difference in YPLL rates. Hispanics are also at particular risk for losses related to congenital anomalies, which include structural defects with which a baby can be born. At the same time, compared to whites, Hispanics have lower YPLL rates for premature losses attributed to cancer, accidents, HIV and conditions related to the perinatal period. When the District ratios are compared to national ratios, the

effect of high YPLL attributed to homicide in D.C. is evident, and accounts for the lack of overall parity in YPLL between whites and Hispanics in the District.

While the differences in premature deaths between Hispanics and blacks are also significant at the national level (the ratio for all causes being 2.1), this disparity is significantly widened in the District. The ratios of YPLL between blacks and Hispanics in D.C. also reveal dramatic differences with respect to some causes, with blacks being at more than 4-fold greater risk overall than their Hispanic counterparts. The indicator underscores a marked disparity in premature deaths attributed to HIV, the difference being over 12-fold between the two subgroups. And Hispanics in the District have one-fourth the risk for premature losses due to cancer compared to blacks. Only for congenital anomalies do blacks have lower YPLL rates than Hispanics, a situation that is not the case at the national level.

Sex Differentials within Subgroups

Gender-based differences, already noted overall, also vary from one subgroup to another. Men and women tend to lead different lives and therefore often die different deaths. Moreover, they die at different ages due to different causes, being exposed to different illnesses and conditions, including violence. Gender affects all of the determinants of health. Although some of the differences may be rooted in biology, most of the disparities are associated with lifestyles, including exposure to risk factors on the job, prevalence of health-related behaviors such as smoking and drug use, and greater ownership and use of firearms. Even within the same environment, men and women may react differently to their surroundings, adopting different behaviors to cope with potential threats and sources of stress. Thus while men may see their options as "fight or flight," women may "tend and befriend,"[35] thereby bolstering their social connections and enhancing their health status. Gender also plays a role in access to health care: nationally, women are more likely to have insurance coverage[36] and a regular source of care.[37] Women not only see a physician more frequently, they also receive more preventive services: in 2005, the national female visit rate for preventive care (74.4 visits per 100 persons) was significantly higher than the corresponding rate for males (44.8 visits per 100 persons).[38] But these

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35 Shelley E. Taylor et al. Behavioral Responses to Stress in Females: "Tend-and-Befriend," Not Fight-or-Flight. *Psychological Review* 107(3), 2000: 411-429.

36 Health Insurance Coverage of Adults Ages 18-64, by Sex, 2006. Kaiser Family Foundation analysis of the March 2007 Current Population Survey, Census Bureau. http://facts.kff.org/chart.aspx?ch=412

37 E Hing, DK Cherry, and DA Woodwell. National Ambulatory Medical Care Survey: 2004 Summary. Advanced Data from Vital and Health Statistics, CDC, No. 374. Hyattsville, Md: National Center for Health Statistics. June 23, 2006: 21.

38 DK Cherry, DA Woodwell, and EA Rechsteiner. National Ambulatory Care Survey: 2005 Summary. Advanced Data from Vital and Health Statistics, CDC, No. 387. Hyattsville, MD: National Center for Health Statistics. June 23, 2006: 4.

differences play out differently in different groups, which explains some of the YPLL variation among populations. The following sections therefore will examine the gender divide within each of the three racial/ethnic groups under study.

Sex differences among blacks

Table 6 presents the differences in YPLL rates for blacks, by sex and major cause of death.

Table 6. *Rate of Years of Potential Life Lost (YPLL) Before Age 70, District of Columbia and United States: 2005, Blacks, All Deaths, by Cause of Death and Sex*

Cause of Death	Rate of Age-Adjusted YPLL per 100,000 Population					
	Male (M)		Female (F)		Ratio M:F	
	D.C.	U.S.	D.C.	U.S.	D.C.	U.S.
All Causes	20,018	12,449.0	9,782.8	7,158.0	2.0	1.7
Homicide	4,460.6	1,614.6	395.3	249.6	11.3	6.5
Heart Disease	2,620.2	2,034.6	1,008.7	1,043.3	2.6	2.0
Cancer	2,022.8	1,609.7	1,444.1	1,365.3	1.4	1.2
HIV	1,840.9	724.0	1,249.7	354.5	1.5	2.0
Perinatal Period	1,557.8	906.7	993.4	734.0	1.6	1.2
Accidents	1,435.4	1,515.0	717.7	586.4	2.0	2.6
Stroke	453.8	371.3	255.8	277.9	1.8	1.3
Diabetes	422.9	321.5	199.7	225.8	2.1	1.4
Congenital Anomalies	330.5	247.9	322.0	232.6	1.0	1.1
Liver Disease	303.6	*	*	*	*	*
Septicemia	*	*	124.0	134.8	*	*
Suicide	*	303.9	*	*	*	*

* Data not included because cause of death is not among the top 10 for YPLL for that population.

As Table 6 shows, among the black population in D.C., males are twice as likely as females to suffer premature losses from all major causes of death, higher than the corresponding ratio for blacks nationally. The gender gap in D.C. is particularly marked for premature losses due to homicide, where it is more than 11-fold higher for males. While presumably living in similar neighborhoods, black men are at much greater risk for violent deaths than their female counterparts, which suggests that the causes are more strongly rooted in differences in behavioral and lifestyle differences than in environmental factors. The YPLL rate for men in D.C. is at least twice as high as it is for women for three additional causes: heart disease, accidents and diabetes. Only for congenital anomalies are the two sexes close to parity. The comparison of gender ratios for the District with those for the U.S. as a whole indicates that the gender differences among

blacks are not as pronounced nationally. Nevertheless, there are some causes (e.g. HIV, accidents) for which gender disparities in YPLL among blacks are greater nationally than in D.C.

Sex differences among whites

Table 7 presents comparable data for whites.

Table 7. *Rate of Years of Potential Life Lost (YPLL) Before Age 70, District of Columbia and United States: 2005, Whites, all Deaths, by Cause of Death and Sex*

Cause of Death	Rate of Age-Adjusted YPLL per 100,000 Population					
	Male (M)		Female (F)		Ratio M:F	
	D.C.	U.S.	D.C.	U.S.	D.C.	U.S.
All Causes	3,484.3	6,641.4	2,806.7	3,857.6	1.2	1.7
Accidents	470.8	1,502.7	411.9	628.7	1.1	2.4
Cancer	549.6	1,070.5	647.0	982.0	0.8	1.1
Perinatal Period	385.2	316.2	559.4	259.1	0.7	1.2
HIV	337.3	*	41.2	*	8.2	*
Heart Disease	284.4	1,023.1	132.1	395.0	2.2	2.6
Suicide	220.6	573.6	*	153.7	*	3.7
Homicide	78.6	130.8	30.0	*	2.6	*
Congenital Anomalies	*	195.9	279.7	172.8	*	1.1
Liver Disease	45.2	155.8	*	70.8	*	2.2
Diabetes	*	126.9	*	78.4	*	1.6
Septicemia	*	*	59.1	*	*	*
Strokes	67.4	*	41.3	93.0	*	*
Chronic Lower Respiratory Disease		107.4	25.7	100.8	*	1.1

* Data not included because cause of death is not among the top 10 for YPLL for that population.

There is less of a difference between the two sexes in YPLL rates among whites in D.C. than there is for other groups in the District, and among whites for the U.S. as a whole. Nevertheless, men are at greater risk overall. The sex-specific distribution of premature losses by cause in D.C. and the U.S. is different for whites than for blacks. This is reflected in the limited overlap of the top 10 causes between genders, particularly in the District, and in the greater variation in cause and gender-specific ratios.

Unlike blacks, for which there are only two causes that appear among the top 10 principal causes of YPLL that are specific to only one sex, the corresponding data for whites in the District reveals seven causes that are among the top 10 for only

one sex. This does not mean that the cause does not affect the other sex equally, but rather that its rate does not rank among the 10 principal causes of premature loss for that particular sex because it may be displaced by other causes or may be affecting persons at older ages. Thus, suicide, liver disease and benign neoplasms are among the principal 10 causes of YPLL for men but not for women. Conversely, losses due to congenital anomalies, septicemia, stroke and chronic lower respiratory disease rank among the top causes of YPLL for women but not for men.

Whereas there is an 11-fold difference in YPLL rates due to homicide between men and women among blacks in D.C., the corresponding ratio for whites is over 2-fold, still marked but considerably lower. And the cause for which there is the greatest gender disparity among whites in the District is HIV (the rate for men being more than 8-fold that for women).

Moreover, whereas among blacks there is no cause for which the YPLL for males is at parity or below compared to that for females, that is not the case for whites in D.C. The burden of YPLL for white men is lower than that for women for cancer and deaths associated with the perinatal period, for which females appear to be at higher risk.

Sex differences among Hispanics

The gender divide in the rate of YPLL is much wider among Hispanics in D.C. than it is among other subgroups. Because gender-based disparities among this population are much more dramatic than they are among Hispanics nationally, some of the disparities may reflect the volatility of small numbers. Hispanics constitute a minority within the District, and the federal government's statistical reports invariably include a caveat stating that death rates for Hispanics should be interpreted with caution because of inconsistencies in reporting Hispanic origin on death certificates.[39] But censuses are also prone to undercounts of this population, thereby also affecting the denominators used to calculate rates. Because both the numerator and the denominator are affected in the same direction, the rates should not be unduly affected by the undercounts. Moreover, to the extent that these conditions apply to both sexes, gender-based comparisons should not be skewed toward either males or females. Nevertheless, the data on Hispanics should be taken as more accurate for general trends and totals than for any specific cause.

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39 This caveat appears in the Technical Notes at the end of the National Vital Statistics Reports. See, for example, DL Hoyer, MP Heron, SL Murphy, H Kung. Deaths: Final Data for 2003. National vital statistics reports; vol 54 (13). Hyattsville, MD: National Center for Health Statistics, CDC. 2006: 105-107.

While men constitute 52.6 percent of total Hispanics in the District, they account for 66.9 percent of years of potential life lost for this population. As seen in Table 8, the YPLL rate for all causes of death is 4.7 times for males what it is for females in D.C.; nationally, the difference is less than 2-fold. Gender differences among Hispanics are therefore wider than among other subgroups, a pattern that possibly reflects difference in lifestyles, occupational risks and care-seeking behaviors. Moreover, *machismo*, a code of behavior which prizes aggressiveness and promotes a sense of invulnerability among men, may place men at particular risk while protecting women (who are considered the guardians of hearth and home) from certain health threats.[40] As a result, as Table 8 also indicates, the two sexes tend to have different causes of premature death. This is particularly dramatic in D.C. Indeed, the two main causes of YPLL for men – accidents and homicide – seem to play a negligible role in the premature mortality of Hispanic women in the District, who appear to be shielded from these violent deaths. At the same time, there are four causes of YPLL losses that are specific to Hispanic women, and that do not rank among the principal causes of YPLL for their male counterparts in D.C. These are suicide, diabetes, nephritis and septicemia.

When Hispanic men and women are compared at the national level, men appear to be at much greater risk for premature losses due to three causes: homicide, suicide, and liver disease. Of these, two are violent deaths and the third is associated with alcohol consumption.

[40] RA Leon et al. Expressions of machismo in Latino relationships. International AIDS Conference, July 11-16, 2004. Abstract #ThPed7906.
gateway.nlm.nih.gov/MeetingAbstracts/102281670.html; Machismo Attitudes Keep Hispanic Men from Going to the Doctor. www.hispanicprwire.com/news.phpl=in&id=149=cha=9

Table 8. ***Rate of Years of Potential Life Lost (YPLL) Before Age 70, District of Columbia: 2005, Hispanics, All Deaths, by Cause of Death and Sex***

Cause of Death	Rate of Age-Adjusted YPLL Per 100,000 Population					
	Male (M)		Female (F)		M : F	
	D.C.	U.S.	D.C.	U.S.	D.C.	U.S.
All Causes	5,544.5	5,939.7	1,184.3	3,083.9	4.7	1.9
Accidents	804.4	1,283.2	*	413.9	*	3.1
Homicide	704.7	505.1	*	95.6	*	5.3
Congenital Anomalies	505.8	213.0	250.0	200.0	2.0	1.1
Cancer	772.6	731.5	67.8	694.5	11.4	1.1
Perinatal Period	505.8	367.8	*	286.4	*	1.3
Liver Disease	296.3	253.2	*	68.4	*	3.7
HIV	220.7	184.1	*	*	*	*
Chronic Lower Respiratory Disease	271.4	*	*	*	*	*
Heart Disease	205.7	692.2	54.4	268.4	3.8	2.6
Influenza & Pneumonia	266.2	*	*	*	*	*
Suicide	*	272.38	115.0	58.8	*	4.6
Diabetes	*	*	151.5	102.3	*	*
Nephritis	*	*	83.1	*	*	*
Septicemia	*	*	83.1	*	*	*
Stroke	*	149.9	*	105.8	*	1.4

* Data not included because cause is not among the top 10 for that particular subgroup.

As reflected in Table 8, the Hispanic male-to-female rate ratios cannot be computed for most of the top 10 causes of YPLL in D.C. because Hispanic men and women are at risk for different causes of premature death. Among Hispanics in the District, there are only three shared causes of premature losses (i.e., conditions that constitute top risks for both genders). For these three – congenital anomalies, cancer and heart disease – men are at greater risk than women for all three but are particularly more vulnerable to premature death due to cancer (a more than 11-fold difference). The latter is at odds with the situation both nationally and for the District as a whole, where losses due to cancer are not as marked between genders (see Table 2 above).

DISCUSSION

Many jurisdictions refer to their "leading causes of death" or "priority health problems" without specifying what yardstick they are using to rank different conditions or what they seek to accomplish. While crude mortality rates may provide a useful approximation of the problems that should be attacked, years of

potential life lost is a more accurate indicator of the impact of premature deaths that are more amenable to prevention. Moreover, YPLL may be a fairer and more ethically appropriate measure of health status, since it weights each person's death by the amount of possible life foregone.[41]

The use of YPLL using data for the District of Columbia points out the extent to which specific subgroups of the population are at particular risk of premature death. In 2000 the U.S. Department of Health and Human Services called for a national plan to eliminate health disparities among the different segments of the U.S. population.[42] The data above show the extent to which the District of Columbia is falling short of this goal. When the YPLL data for the District are compared with those nationally, it is obvious that whites and Hispanics in D.C. have better life chances than their counterparts throughout the nation. Blacks in the District, however, at much greater risk for premature death than blacks in the U.S. as a whole. The use of YPLL therefore highlights the extent to which the District of Columbia magnifies the ethnic/racial disparities that afflict the nation.

Although the nation's capital prides itself in its diversity of races and cultures, it has little to boast about in terms of health outcomes as measured in years of potential life lost. The breakdowns by race and sex show that different subgroups are at differential risk, and that the losses due to ill health and violence are far from evenly distributed. Blacks are at considerably higher risk than whites and Hispanics for most causes of death, particularly for homicide and HIV. And each of the subgroups examined – blacks, whites, Hispanics – reflect different priorities in terms of reducing premature losses. Any citywide campaign that does not take this into account is therefore bound to fail. In terms of health and life expectancy, blacks, whites and Hispanics can be said to live in different cities even when they share the same urban space.

The data also highlight the extent to which traditional chronic conditions affecting individuals have been superseded as causes of premature death by causes linked to social behavior, including homicides, injuries and HIV, in accounting for years of potential life lost. While chronic conditions account for most of the premature losses among whites, that is not the case for blacks and Hispanics, who together constitute more than 63 percent of the total D.C. population.

While the media speak of acts of "random violence" occurring in the District, the fact is that the existing violence is far from random. Instead, it primarily affects

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41 CJL Murray, The Infant Mortality Rate, Life Expectancy at Birth and a Linear Index of Mortality as Measures of General Health Status. *International Journal of Epidemiology* 17 (1988): 126.
42 U.S. Department of Health and Human Services. Health People 2010. 2nd edition. Understanding and improving health and objectives for improving health; 2 volumes. Washington, D.C.: U.S. Government Printing Office, 2000.

some areas and specific segments of the population, and has had a marked differential effect on certain subgroups. Among young black men the impact of violence is particularly evident from the use of YPLL. It is therefore not surprising that the District is using a variety of measures – including more stringent gun-control measures, checkpoints and the imposition of curfews – to curb the rate of homicides. These, while necessary, may not be sufficient to address the problem. A more comprehensive strategy has to include upgrading housing quality, insuring more equitable access to goods and services, creating communities that foster social networks and boost opportunities for economic redevelopment in blighted areas.

Among Hispanics, the more than 4-fold differential in rates of YPLL between the sexes suggests different exposures to risk. The prevailing gender-based division of labor, together with distinct cultural expectations regarding male and female behaviors, appear to place men at greater risk or, conversely, to protect women against some potential premature deaths. And the fact that the gender divide is not only one of magnitude but also of type, with each sex being particularly vulnerable to given conditions, emphasizes the need to customize health messages by subgroup as well as by gender.

The complicated etiology of premature deaths in the District means that, as Link and Phelan have stated, public health activities have to transcend their current boundaries and look not just at what health professionals do but also at the array of human actions that have important health consequences.[43] In the nation's capital, YPLL rates provide eloquent testimony that being a numerical majority does not protect against being disadvantaged. The foreshortened lives of blacks in the District of Columbia may represent individual tragedies, but they also represent a collective failure of the body politic. By "giving simple statistical expression to the harsh reality of death at younger ages,"[44] the indicator of years of potential life lost underscores those populations that are very much at risk.

IMPLICATIONS FOR POLICY

The District of Columbia has been called a "city etched by divides" by its own Chamber of Commerce.[45] Similarly, the D.C. Fiscal Policy Institute has described the District as having "two economies:" one characterized by stable jobs, a construction boom, and neighborhood revitalization; the other, by lagging wages,

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43 Bruce G. Link and Jo C. Phelan, McKeown and the Idea that Social Conditions Are Fundamental Causes of Disease. *American Journal of Public Health.* 92 (5) May 2002: 730-732.
44 Romeder and McWhinnie, op. cit.: 150.
45 June 2007 report quoted in Sylvia Moreno, Poverty Rate Grows Amid an Economic Boom: D.C.C's Poorest Left Behind By Renewal, Report Finds. *Washington Post,* October 24, 2007: B01. http://www.washingtonpost.com/wp-dyn/content/article/10/23/AR2007102302230_...

persistent unemployment and inadequate services.[46] The data on YPLL mirror this situation, dramatizing the racial dimension and health implications of this duality.

The breakdown of YPLL by race, sex, and cause underscores the need for broad-based interventions at the same time that it suggests priorities for immediate action.

1. The District should make use of the striking disparities in YPLL documented in this report to set health priorities and monitor existing disparities. The indicator is easy to calculate and easy to understand, and will highlight those causes that account for the greatest burden of life lost. Furthermore, by focusing on premature deaths, it emphasizes factors and conditions that are amenable to prevention.

2. Violence among blacks has to be treated as the epidemic it has become. As in other outbreaks, all three components of the epidemiological triad – host, agent and environment – have to be taken into account in combating premature deaths, particularly among males. The recent U.S. Supreme Court decision against D.C.'s gun laws presents an opportunity to rethink the issue of firearms and their availability. This is especially necessary given that the prior restrictions were not extremely effective in preventing premature losses due to homicide. Although the Court struck down D.C.'s ban on handguns as incompatible with Second Amendment rights, the ruling did not imply that the right to bear arms is absolute. Washington D.C. therefore needs to adopt new regulations that will curtail the misuse of firearms within the current law and insure the protection of the public's health. The fact that violence is shortening the lives of so many D.C. residents should be part of the rationale for adopting new measures. Ongoing mapping and tracking of homicides needs to be accompanied by broader interventions to break the vicious cycle of violence and poor health. Those communities or neighborhoods identified as high risk can also be redesigned to promote safer spaces for the population as a whole. Principles of "defensible space" which have been found to enhance a sense of security and increase residents' ability to monitor their surroundings should be adopted.

3. Educational preventive campaigns need to target specific subgroups, neighborhoods, and causes. Spokespersons should reflect the issues each community faces, and project the message of a caring, concerned city government that values its constituents. Community-based organizations must be enlisted and made partners in the fight against premature deaths. Many of these organizations are already coping with the realities of blighted lives; they

[46] Ed Lazere, *D.C.'s Two Economies: Many Residents Are Falling Behind Despite the City's Revitalization.* D.C. Fiscal Policy Institute. October 2007. http://www.D.C.fpi.org/10-24-07DC.pdf

are well-prepared to address the causes as well as to remedy the results of poverty and powerlessness.

4. The high rate of YPLL due to congenital anomalies among Hispanics in D.C. requires particular attention. While national folic acid fortification has reduced the incidence of some congenital anomalies among all groups throughout the country, it has had a greater impact on high-income groups, thereby increasing disparities by socio-economic status.[47] To the extent that certain ethnic and racial groups are disproportionately poor, they have lagged in benefiting from the fortification policy. The promotion of folic acid consumption among women of childbearing age therefore needs to zero in on those groups, including Hispanics, who are not reaping the benefits of fortification and are thus at greater risk for birth defects.

[47] Jennifer Beam Dowd and Allison E. Aiello, Did national folic acid fortification reduce socioeconomic and racial disparities in folate status in the U.S. *International Journal of Epidemiology* 2008; 1-8.