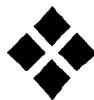# EFFECTS OF DIMINISHED ECONOMIC OPPORTUNITIES ON SOCIAL STRESS:
HEART ATTACKS, STROKES, AND CRIME

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Effects of Diminished Economic Opportunities on Social Stress:
Heart Attacks, Strokes and Crime

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Summary

The unemployment rate which reached a peak of 7.8 percent in this recession continues to hover at 7.5 percent more than two years after the recession began. Poverty rates have risen to levels higher than in any other industrialized nation, and the income gap between rich and poor continues to grow. The worsening economic situation has led not only to financial hardship but to psychological trauma that extends beyond those who are experiencing unemployment and poverty to those Americans who fear the possibility of job loss and declining economic status. Though often overlooked, earlier research has clearly linked increases in stress as a result of declining socioeconomic status and diminished economic opportunities to health-related problems and criminal aggression (Brenner 1984; Brenner and Mooney 1983).

The economic and social costs associated with unemployment and poverty can be quite significant. Using data from 1976 to 1990 for 30 major metropolitan areas in the United States, with a combined population in 1990 of nearly 80 million people, this report uncovers striking statistical relationships between deteriorating economic opportunity (as measured by unemployment, poverty, and wage inequality) and the incidence of heart attacks, strokes, and crimes against persons and property. Our estimates show that a one percentage point rise in the unemployment rate results in a:

In addition to the relationship between unemployment and social stress, this report highlights the effect of an increase in the poverty rate on homicides, violent crimes, and robberies. Poverty increased 1.4 percentage points, from 11.7 percent of the U.S. population in 1979 to 13.1 percent in 1988. We estimate that, as a result of this increase in the poverty rate, the number of homicides was 10 percent higher in 1988 than in 1979; the number of violent crimes was six percent higher; and the number of robberies was seven percent higher.

The findings reported in this briefing paper strongly suggest that economic policies that create jobs and decrease poverty will significantly reduce fatalities due to heart attacks and strokes and will lower crime rates.

Theoretical Background

Previous research has suggested an association between deteriorating economic opportunities, represented by rising unemployment, poverty, and wage inequality, and social pathologies, illness, and mortality. Higher levels of stress as a result of a worsening of economic conditions take their toll on the health of the population and can also show up as aggression directed towards society. Directed outward, the stress may lead to an increase in criminal activities. Directed towards oneself, stress may result in higher rates of morbidity and mortality as depression, poor diet, and consumption of alcohol and cigarettes increase.

The most proximate economic change leading to psychological stress is unemployment. Increases in the

- 5.6 percent increase in deaths due to heart disease;
- 3.1 percent increase in deaths due to stroke;
- 6.7 percent increase in homicides;
- 3.4 percent increase in violent crimes; and,
- 2.4 percent increase in property crimes.

These results can be applied to the increase in unemployment during the current recession to estimate the recession's effects on health and crime. The unemployment rate rose from 5.5 percent in mid-1990 to 6.5 percent in mid-1991 and to 7.5 percent by mid-1992. Based on our results, we estimate that in the metropolitan areas covered by this analysis' these increases in the unemployment rate may have been responsible during the two-year period for:

- 35,307 additional deaths due to heart disease;
- **2,77** 1 additional deaths due to stroke;
- 1,459 additional homicides;
- 62,607 additional violent crimes (including burglary, aggravated assault, and murder); and,
- 223,550 additional property crimes (including robbery, larceny, and motor vehicle theft).

The direct cost to the American public to send three percent of those arrested for violent crimes and property crimes to prison for one year is approximately $45 million. (This is the percentage of arrests that, on average, results in a jail term in any given year.) This does not include the costs borne by the victims of these crimes.[2]

unemployment rate affect people through several channels: some lose their jobs, some fear losing their jobs, and some become discouraged at their prospects of ever finding a job.

For those who have lost their jobs, the primary sources of stress are loss of income, which brings with it the potential of falling into poverty, downward social mobility, and loss of **self-**esteem. The financial loss is heightened by the loss of job- related benefits such as health coverage (Brenner 1984). For those remaining employed, stress can occur because there is a more pronounced threat of unemployment, more pressure at work for those in companies experiencing financial distress, and greater strains on social relationships as workers compete to retain jobs. All of these factors contribute to an elevation of tension and stress in the workplace as the unemployment rate rises. For new entrants into the labor market, the rising unemployment rate may signal that the prospects of finding legitimate employment are poor. This may be particularly true for young people entering the labor market for the first time. For some of these discouraged workers, illegitimate activities may provide an alternative source of income and self- esteem.

A sustained increase in unemployment can also lead to increases in poverty as the unemployed fall through the gaps in the social safety net. This recession-induced increase in poverty is in addition to the long-term trend increase in the poverty rate that has occurred over the last decade. Low socioeconomic status, whatever its cause, is associated with an increased incidence of health problems and criminal behavior.

There are several important reasons for the association between poverty and poor health. First, the poor have limited access to health care facilities and services. This is exacerbated

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for the 37 million Americans who are without health insurance, many of whom are among the working poor. Second, the poor lack information regarding available programs and services that can lead to an improvement in health. Third, poverty is stigmatizing, which can deter many from seeking assistance. This is compounded by the fact that public welfare services in the United States are inadequate and may demoralize recipients. Finally, major changes in welfare programs were instigated under the Reagan administration. Many programs were cut back or eliminated, including programs most closely related to public health and assistance to the poor such as Aid for Dependent Children (AFDC) (cut back), Food Stamps (cut back), Title XX Social Services (cut back), and Community Services Block Grants (eliminated). This lowering of the social safety net induces higher levels of stress and anxiety among both the poor and those in danger of becoming poor.

The relationship between poverty and criminal activities reflects in part the high concentration of unemployment among the poor. This is particularly acute for young male adults who often have extremely high rates of unemployment. As argued by the sociologist Robert K. Merton, "those who find themselves denied the positions which the egalitarian myth has led them to believe are open to them may be driven to adopt high but 'deviant' ambitions" (Merton 1957, Chap. IV).

Not only has the absolute economic position of many American workers declined, but the wage gap between low-skill and high-skill workers has increased. In the 1979-1988 period, the ratio of wages of college-educated workers relative to high school-educated workers increased by more than 15 percent (Bound and Johnson 1992). This change is driven by a decline in

the real wage of low-skill **workers**.[3] Given that over 50 percent of the workforce in the United States does not have a college degree, these earnings trends have a significant impact for the majority of U.S. workers.

The links between the deterioration in the distribution of wage income and social pathologies are based upon the comparisons individuals make between their own position and that of different groups or individuals within their society. Comparison of one's present position relative to that of others (or to one's own past position) is a way of assessing how well one is doing and affects one's levels of satisfaction or stress. By way of analogy, consider the following. Everyone is stuck in a two-lane tunnel leading to the big city, only now one of the lanes begins to progress very quickly. What happens to the level of stress of those stuck in the slow lane?

Methodology

This report uses the statistical technique of multivariate regression to analyze the relationship between economic **stressor** variables, such as a change in the unemployment rate, and associated stress outcome variables, such as the incidence of fatal heart attacks.   The goal of the analysis is to address questions such as:

- Does a relationship exist between the **stressor** variable and social stress outcomes?
- If a relationship exists, how strong is it?
- Can a model be developed to assist policymakers in reliably predicting the likely changes in social stress

outcomes given a change in the unemployment rate or other stressor?

The primary explanatory **stressor** variables in this analysis are year-to-year changes in the unemployment rate and the level of the poverty rate. Outcome, or dependent, variables include death rates due to heart attack and stroke, and crime rates, including categories relating to violent crimes and property crimes. Control variables are also included in the analysis. The control variables are used to model the levels of the outcome variables more realistically, and to add explanatory power. An important control variable is the year of observation. It is included to represent an array of variables that affect the health status of the population or crime rates and that have changed over time, but that are not specifically included in the **model**.[4]

The models used in this analysis differ slightly in terms of specification. All include time and population density as controls. The crime equations are designed to measure the short- term effects of year-to-year changes in unemployment. In contrast, the health equations consider that the effects of sustained unemployment manifest themselves more gradually. In these equations, the current unemployment rate and the unemployment rates for the two previous years are used.

Our analysis demonstrates that significant relationships exist between the rates of unemployment and poverty on the one hand and death rates from heart disease or stroke and crime rates on the other. Our confidence in the significance of the results uncovered by the regression analysis is increased by the use of data that vary both across geographic region and through time. In analyses that use this type of data, the probability that the

relationships that are found are meaningful, and not spurious, typically exceeds 99 percent. Data that are comparable and complete are available for 30 metropolitan regions (**SMSAs**) across the United States for the years 1976 to 1990. Appendix Table Al lists the SMSAs used in this analysis.

The pooling of cross sections through time-that is, the use of data from all 30 SMSAs in each year-increased the variability of the data and improved our ability to disentangle substantive from random effects. A slight drawback is that with more varied data, explanatory power may be reduced. The percentage of the variability of the outcome variable explained by the model is a customary way to assess performance. On this criterion, the robbery model exhibits the strongest performance and burglary the weakest. Sixty-two percent of the variable in the incidence of robberies is explained by the economic variables included in the analyses. For burglaries, the model explains 17 percent of the variance. For varied cross-sectional data, with over 300 observations, these percentages are remarkably high.

Multivariate regression models are designed to help disentangle the statistical correlations that occur between the variables; but it is theory, not statistics, that explains the direction of causation. The empirical results described in the next section confirm that a deterioration in economic conditions believed to cause social stress is associated with significant increases in some or all of the following outcomes: heart attacks, strokes, suicides, accidents, homicides, violent crimes, and property crimes.

Finally, the unit of observation in this study is a metropolitan area or SMSA, not an individual. The regression results demonstrate that changes in economic conditions can be expected to lead to changes in social stress outcomes aggregated

over an entire SMSA. We would not expect the results to apply to an individual drawn from the population.

Empirical Results

The results of this report are summarized in Tables 1 and 2. In **Table 1 we** provide estimates of the impact of a one percentage point increase in the unemployment rate for a variety of social stress outcomes. Column A provides the total incidence of the social stress outcomes per 100,000 population in our sample of 30 SMSAs. This number was derived by weighing the reported incidence per 100,000 for each SMSA in 1990 by its respective population, summing over all 30 SMSAs, and converting to incidence per 100,000 for the total population of our sample. The numbers reported in Column B are the regression estimates indicating the effect of a one percentage point change in the unemployment rate on the social stress outcome. This estimate shows the immediate impact of a rise in the unemployment rate on social stress outcomes. (Regression results are reported in Appendix B **.)**

Table 1 can be read as follows. There were 387.8 deaths per 100,000 population due to major heart disease in the 30 SMSAs of our sample in 1990. Approximately 2 1.7 of these deaths could be attributed to a one percentage point increase in the unemployment rate, say from 5.5 to 6.5 percent. The proportion of deaths due to heart disease when unemployment rises by one percentage point is therefore 5.59 percent, which is reported in Column C. **Table 2,** which reports the results of poverty on social stress outcomes, can

be read in the same way. For example, Table 2 reports that 11.8 suicides per 100,000 population occurred in our sample in 1990. The estimated number of suicides due to a one percentage point increase in poverty, say from 12.0 to 13.0 percent, was 0.10 per 100,000, or 0.84 percent. Similarly, the number of robberies per **100,000** population in the 30 **SMSAs** in 1990 was 514.1. The estimated number of robberies due to a one percentage point increase in poverty was 27.0, or 5.25 percent.

In interpreting these results, several features should be kept in mind. An increase in the unemployment rate does not simply increase all types of crime. While robbery and theft significantly increased, rape did not. This highlights the fact that not all crimes can be associated with economic factors.

Second, mortality due to major heart disease or stroke does not appear to be linked to the poverty rate. This is a surprising finding and requires further investigation. It is possible that the model may not be able to detect the association because of the relative stability of the poverty rate compared to the volatility of the unemployment rate.

Finally, it is important to highlight the differences between short- and long-term effects. Changing economic opportunities have an immediate impact on some stress outcomes, such as homicides. These short-term effects are detected quickly. Effects on disease can show up in both the immediate and long term. The change in economic conditions may set the stage for development of the disease in some people and may exacerbate health problems of other members of the population already experiencing difficulties, triggering higher rates of mortality among this group in the short run. This study has examined the short-run effects of deteriorating economic conditions, focusing on immediate

increases in crime rates and on increases in mortality rates over a two-year period.

An additional finding of this study, not reported in the tables, examines the effect of wage inequality on criminal activity. The sample of 30 metropolitan areas experienced a five percent increase in wage inequality (based on the **Gini** coefficient) between the successive business cycle peaks in 1979 and 1988. This five percent increase in inequality is related to the following statistically significant changes in criminal activity:

- Violent crime up 2.05 percent;
- Property crime up 1.87 percent;
- Murder/non-negligent manslaughter up 4.2 1 percent;
- Robbery up 1.79 percent;
- Aggravated assault up 3.10 percent;
- Larceny/ theft up 1.95 percent; and
- Motor vehicle theft up 2.21 percent.

Conclusion

The main findings of this study are that changes in economic conditions, as indicated by unemployment, poverty, and inequality, have significant implications for the incidence of heart attacks, strokes, suicides, accidents, and criminal activity. A deterioration in economic opportunities raised mortality rates and crime rates in the 30 major metropolitan areas examined in this study. To reiterate our most important finding, a one percentage point rise in the unemployment rate increases deaths due to heart disease by 5.6 percent, deaths due to stroke by 3.1 percent,

homicides by 6.7 percent, violent crimes by 3.4 percent, and property crimes by 2.4 percent. The recession has indeed exacted a high cost in terms of these social pathologies.

October, 1992

Table 1

Proportion of Social Stress Outcome Due to a One Percentage Point Increase in the Unemployment Rate for Major Standard Metropolitan Areas (1990 basis)

Social Stress Outcome	Incidence per 100,000 in 1990[1]	Estimated Incidence/ 100,000 due to a 1 percentage point increase in the Unemployment Rate[2,7]	Proportion due to a 1 percentage point increase in the Unemployment Rate
Major Heart Disease Mortality[3]	387.8	21.7[*]	5.59%
Cerebrovascular (stroke) Mortality[3]	55.8	1.7[*]	3.05%
Homicide Mortality[4]	13.2	0.89[*]	674%
Violent Crime[5]	1158.4	39.3[*]	3.39%
Property Crime[6]	5941.7	140.5[*]	2.36%
Murder/Non-negligent Manslaughter	14.9	0.76[*]	5.10%
Robbery	514.1	19.7[*]	3.83%
Burglary	1353.3	49.9[*]	367%
Larceny/Theft	3442.4	73.2[**]	2.12%

[1] To determine the total incidence per 100,000 of a social stress outcome in our major Standard Metropolitan Statistical Area (SMSA) sample we weight the reported incidence (per 100,000) in each SMSA by the population of the respective SMSA and sum over all SMSAs.

[2] Results are based upon a pooled cross-section time series regression of 30 major metropolitan areas over the years 19761990. Control variables are: time trend, percent poverty, wage inequality, and population density. A '*' indicates the probability of this occurring by chance is less than 1 percent and a '**' indicates the probability of this occurring by chance is less than 5 percent.

[3] Based on linear regressions over the SMSA sample for the period 1977-1988 with two period lags in the unemployment rate controlling for time trend, percent poverty, and population density. Only statistically significant coeffients are counted. Report totals are for 1988.

[4] Report totals are for 1988.

[5] Violent Crimes are reported offenses of murder, forcible rape, robbery, and aggravated assault. Numbers may not add due to rounding.

[6] Property Crimes are reported offenses of burglary, larceny-theft, and motor vehicle theft. Numbers may not add due to rounding.

[7] We found no significant effect of a change in the unemployment rate on forcible rape, aggrevated assault, or motor vehicle theft.

Table 2

Proportion of Social Stress Outcome Due to
a One Percentage Point Increase in the Poverty Rate
for Major Standard Metropolitan Areas (1990 basis)

Social Stress Outcome	Incidence per 100,000 in 1990[1]	Estimated Incidence/ 100,000 due to a 1 percentage point increase in the Poverty Rate[2]	Proportion due to a 1 percentage point increase in the Poverty Rate
Suicide[3]	11.8	0. 10"	0.84%
Accident Mortality[3]	35.1	0.27'	0.76%
Homicide Mortality[1]	13.2	0.96'	7.27%
Violent Crime[4]	1158.4	48.1˙	4.15%
Property Crime[5]	5941.7	116.4'	1.95%
Murder/Non-negligent Manslaughter	14.9	0.92'	6.17%
Forcible Rape	43.6	1.05'	2.40%
Robbery	514.1	27.0'	5.25%
Aggravated Assault	586.1	23.4'	3.99%
Burglarly	1353.3	47.5'	350%
Larceny/Theft	3442.4	51.7'	1.50%
Motor Vehicle Theft	1145.9	20.7'	1.80%

[1] To determine the total incidence per 100,000 of a social stress outcome in our major Standard Metropolitan Statistical Area (SMSA) sample we weight the reported incidence (per 100,000) in each SMSA by the population of the respective SMSA and sum over all SMSAs.

[2] Resuits are based upon a pooled cross-section time series regression of 30 major metropolitan areas over the years 1976-1990. Control variables are: time trend, percent poverty, wage inequality, and population density. A '*' indicates the probability of this occurring by chance is less than 1 percent; a '**' indicates the probability of this occurring by chance is less than 5 percent.

[3] Based on the SMSA sample for the period 1977-1988. Report totals are for 1988.

[4] Violent Crimes are reported offenses of murder, forcible rape, robbery, and aggravated assault. Numbers may not add due to rounding.

[5] Property Crimes are reported offenses of burglary, larceny-theft, and motor vehicle theft. Numbers may not add due to rounding.

[6] We found no significant effect of a change in the poverty rate on heart attacks or strokes.

Appendix A: Data Documentation

The unit of analysis used in this study was 30 major standard metropolitan statistical areas (SMSA) over the years 1975-1990. The choice of SMSA was based upon the availability of data in the earlier years of the study. A list of the **SMSAs** is given in Table Al. For the regression models, the following variables and sources by SMSA were employed:

Crime **Data Source:** *Uniform Crime Reports for the U.S. **1975-1** 990,* published by the Federal Bureau of Investigation, U.S. Department of Justice. Variables are crimes reported to the police per 100,000 population and include: total crime index - the sum of violent and property crimes; Violent Crime - reported murder, non-negligent manslaughter, forcible rape, robbery and aggravated assault; Property Crime - reported burglary, larceny, theft, and motor vehicle theft; murder and non-negligent manslaughter; forcible rape, aggravated assault, robbery, burglary, larceny; and motor vehicle theft.

Mortality Data *Source: Vital Statistics of the United States,* U.S. Department of Health, Education, and Welfare. Variables are converted to incidents per 100,000 and include mortality due to major cardiovascular (heart attacks), cerebrovascular (strokes), accidents, suicides, and homicides.

Wage Inequality Measure Source: *Current Population Survey Files for May 1975-l 985; March **1982, 1986-l 990.*** Sample for each year was workers who reported employment as their primary activity

and who usually worked 30 hours or more per week. The wage is the reported hourly wage for a worker and if this was not available, then the hourly wage was computed by dividing usual weekly earnings by usual hours of work per week. Hourly wages are top coded which gives estimates of wage inequality that are biased downward. This implies that the results of this study are conservative estimates. Average wages by schooling categories were computed from the census tapes for use in inequality measures, such as the **Gini,** Piesch, Bonfer, and Mehran coefficients which were computed over the sample of individual workers by SMSA.

Poverty Rates *Source: Current Population Survey March Annual Demographic Files 1975-l 990.* Poverty rates were calculated for each Standard Metropolitan Statistical Area based upon the proportion of families with reported income levels below the government specified poverty line for each year. The census question was **a** coded response for the ratio of family income to poverty level. Actual frequencies and weighted frequencies were computed.

Unemployment Rates Source: *Geographic Profile of Employment and Unemployment 1975-1990.* Published by U.S. Department of Labor, Bureau of Labor Statistics. The unemployment rate used was for all civilian workers.

SMSA Demographic Characteristics: Race and age composition rates by SMSA were derived from the Current Population Survey March Annual Demographic Files 1975-1990. Both actual frequencies and weighted frequencies were computed.

Table Al
SMSA's Used in Report

Anaheim/Santa Ana, CA
Atlanta, GA
Baltimore, MD
Boston, MA
Buffalo, NY
Chicago, IL
Cincinnatti, IN
Cleveland, OH
Dallas, TX
Denver, CO
Detroit, MI
Houston, TX
Indianapolis, IN
Kansas City, MO,KS
Los Angeles/ Long Beach, CA
Miami, FL
Milwaukee, WI
Minneapolis/St.Paul, MN, WI
Newark, NJ
New York, NY
New Orleans, LA
Philadelphia, PA
Pittsburgh, PA
Portland, OR
San Bernadino/ Riverside, CA
San Diego, CA
San Jose, CA
Seattle, WA
St. Louis, MO
Washington, DC