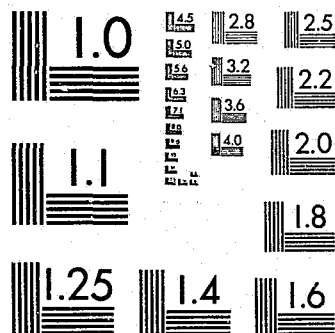National Criminal Justice Reference Service

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National Institute of Justice
United States Department of Justice
Washington, D. C. 20531

9/26/83

Patterns of Change Over Time in United States Homicides

Analysis prepared for
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Criminal Justice Information Systems
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Chicago, Illinois 60202

April 22, 1982

Note to the Reader

The analysis summarized in this report was carried out at the request
of Brandon S. Centerwall, M. D., M. P. H., Center for Health Promotion
and Education, Centers for Disease Control, U. S. Public Health Service,
and utilizes data collected by the National Center for Health Statistics.
We would like to thank Dr. Centerwall for presenting us with such an
interesting problem, for his cooperation and suggestions during the
analysis, and for his permission to publish these results.

The analysis method is time series pattern description. For more
information about the method, see the Statistical Analysis Center report,
"Pattern Description Manual." For an example of the use of pattern
description, see "Patterns of Change in Chicago Homicide: The Twenties,
The Sixties and The Seventies."

Introduction

This report describes the overall pattern of change in the homicide rate in the United States from 1940 through 1977. The source of the data is the National Center for Health Statistics, which collects homicide death statistics from coronor's offices, medical examiner's offices, and other official public health agencies. These homicides include all instances of persons killed by another person, regardless of the criminal justice system's classification. Thus, they include murder, voluntary and involuntary manslaughter, and justifiable homicide.

The analysis method is time series Pattern Description. In brief, this method produces a simple description of the pattern of change over time in a variable, a description that is easy to understand and to communicate to a general audience. It uses linear spline regression to find the best-fitting segmented line, given certain qualitative and quantitative criteria. The present analysis uses the following criteria:

1. The line segment fit would have no more than four segments. With only 38 years in the series, four segments seemed to be the maximum number consistent with the goal of a simple description. For the metropolitan and non-metropolitan series, which contain only 28 years, our criterion was a maximum of three segments.

2. No segment would be shorter than four observations (years.) Again, a line segment fit with a change in regression every three years would not be a simple pattern description.

3. The segmented line would fit the series better than any other segmented line meeting the first two criteria. As a measure of accuracy, we use Cp, a statistic developed by Mallows that is closely related to the sum of square residuals.

The most obvious characteristic of a linear spline regression is that every segment is connected to the next segment. Although there may be an abrupt difference between the slope of one segment and the slope of the next, there is no discontinuous gap between them. The line may change direction, but it remains unbroken. Instead of fitting separate regression lines to sections of the series, a linear spline regression fits one continuous line to the entire series. Because every segment is connected to the next, the best fit for one segment is affected by the best fit for the next segment.

Pattern descriptions should not be interpreted as exact statistics, but in an exploratory way, as simple descriptions of the general pattern of change over time in a variable. For example, do not try to say that a turning point in the pattern of homicide rates occurred, say, in June, 1970. Rather, say that the entire series is best described by a two segment line, generally increasing through the sixties, and then decreasing.

This analysis was done in response to a request by the Centers for Disease Control, and the series we analyze are series provided by that agency, yearly homicide rates per 100,000 population. There are fourteen series in all: the total United States, white and nonwhite victims, metropolitan and non-metropolitan counties, and each of nine geographical areas of the United States. The total, the white and the nonwhite victim rates have been age-adjusted. That is, each figure has been weighted according to the age distribution of the population in that year. Rates for metropolitan and non-metropolitan counties are available only from 1950, and are not age-adjusted. Metropolitan counties are those within the Bureau of the Census's Standard Metropolitan Statistical Areas. Homicide rates for the geographical areas of the country also have not been age-adjusted. Data for the Pacific states include Hawaii for the entire period, but Alaska for only the period beginning in 1945.

It is necessary to use some caution in interpreting any pattern description of rates. Homicide rate patterns do not necessarily reflect increases or decreases in the number of homicides committed. The comparison of the pattern of change over time in the homicide rates of two groups could, therefore, be confounded by the patterns of change over time of the two populations. For example, if the population of the metropolitan counties fell while the number of homicides remained the same, the homicide rate would rise. To decide whether patterns of change are due to the pattern over time of the number of homicides, the pattern over time of the population structure, or to both, it would be necessary to describe the patterns of the raw homicide data and the population data separately. Although the analysis in this report is limited to the description of the transformed data series, homicide rates and age-adjusted homicide rates, we suggest that the conclusions from this analysis be considered tentative until the raw data have been separately described.

Total United States Homicide Rate

The best description of the pattern of change in the age-adjusted homicide rate in the United States from 1940 through 1977, given the criteria discussed above, is a four segment line that fell slowly through the forties and early fifties, began to increase in the late fifties, increased very rapidly until the early seventies, and then fell again (see Figure 1.)

The World War II years fluctuated around the generally decreasing pattern of the forties. The rates in 1943 and 1944 were low, and the immediate post-war years were high. In fact, the two additional lines in the best six segment fit for this series reflect the World War II fluctuation (see Figure 2.) One segment decreases during the initial four years of the series, and the other increases during the next four years.

Aside from this fluctuation, there was little change in the overall pattern of age-adjusted homicide rates from 1940 until the early sixties. However, the sixties saw a very rapid rise, which was followed by a decline in the mid-seventies that was nearly as rapid. This pattern is similar to the patterns for parts of the United States found in other research. For example, in Chicago, the number of homicides increased rapidly from 1965 to 1970, continued to increase at a slower rate from 1970 to 1974, and decreased rapidly after 1974 (see "Patterns of Change in Chicago Homicide.")
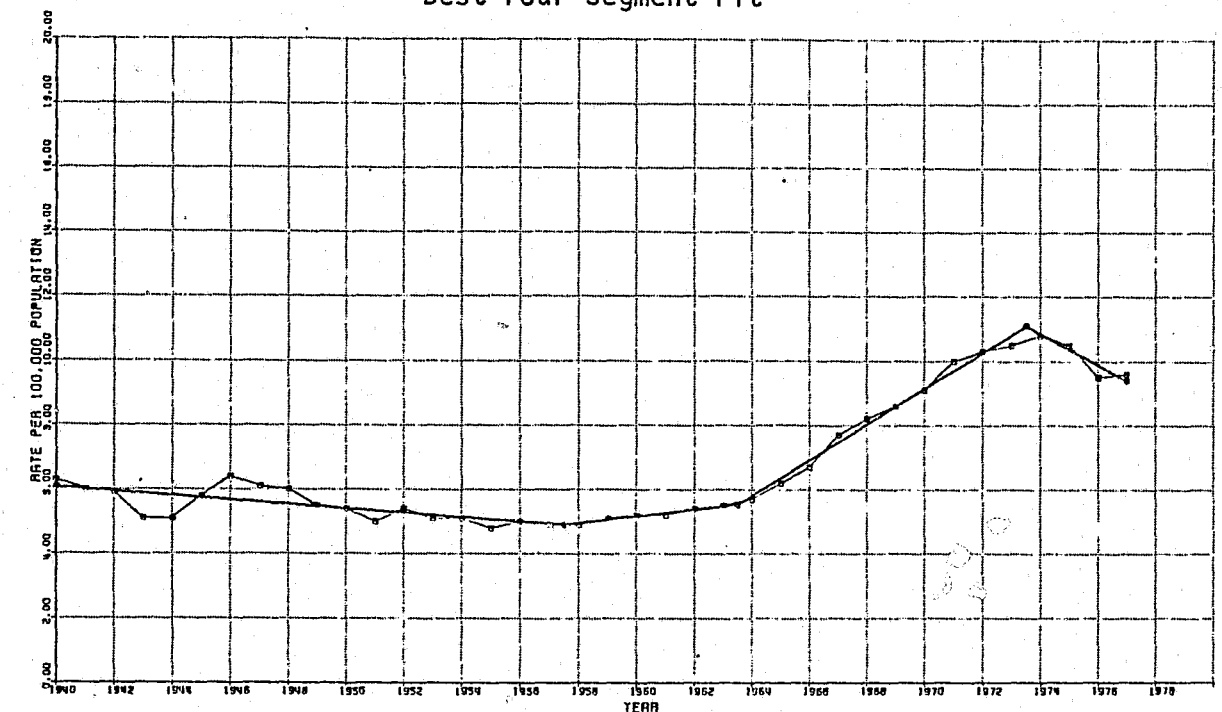
What accounts for this pattern of change over time in United States homicide rates? If we can specify the pattern, that is, if we can determine that the general pattern seen in United States rates occurred only in some types of homicide but not in others, then we have narrowed the search for an explanation. For example, did the rapid increase of the sixties occur only in big cities like Chicago, or did it also occur in small towns and rural areas? The following sections of this report compare the patterns of types of homicide in the United States, to determine whether or not the pattern of a single type of homicide or the pattern in a particular area of the country can account for the total pattern of United States homicide rates.

AGE-ADJUSTED HOMICIDE RATES, UNITED STATES, 1940-1977
RAW DATA SERIES = □
MULTI-SEGMENT LINE = ○
SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS

Figure 1
Best Four Segment Fit

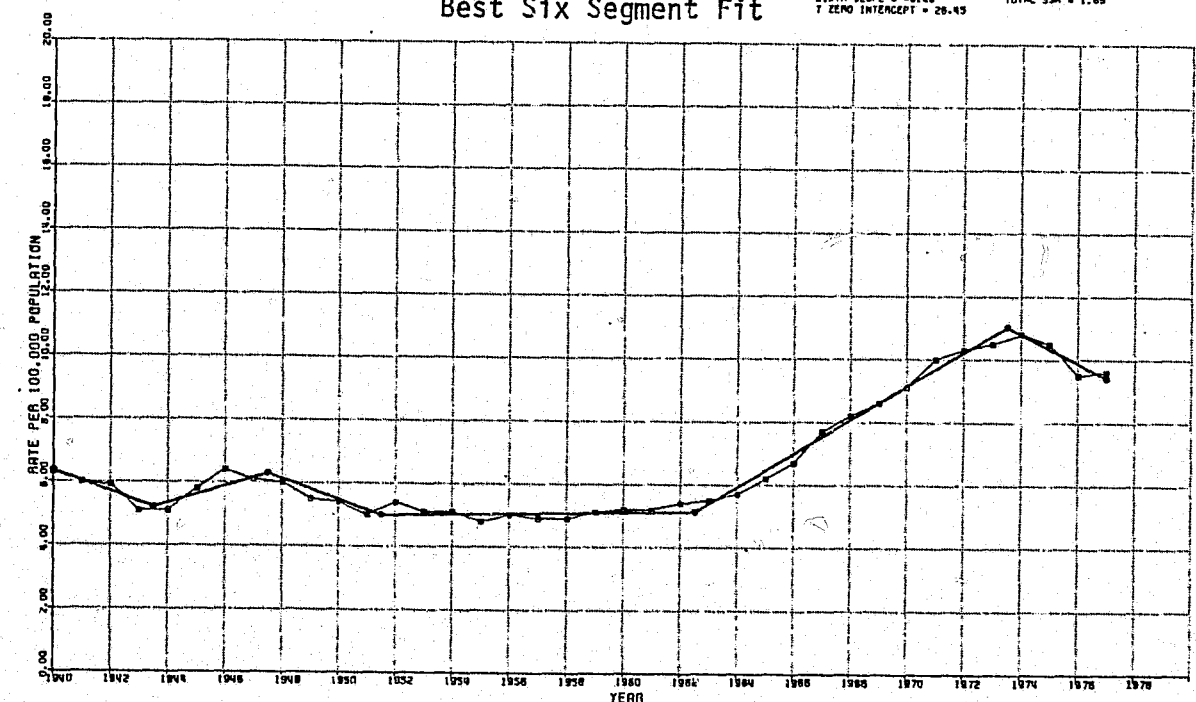

ILEC CRIMINAL JUSTICE INFORMATION SYSTEMS -
STATISTICAL ANALYSIS CENTER GRAPH

AGE-ADJUSTED HOMICIDE RATES, UNITED STATES, 1940-1977
RAW DATA SERIES = □
MULTI-SEGMENT LINE = ○
SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS

Figure 2
Best Six Segment Fit

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STATISTICAL ANALYSIS CENTER GRAPH

Metropolitan and Non-Metropolitan Counties

In 1950, the homicide rate in the metropolitan counties of the United States was almost exactly the same as the rate in the non-metropolitan counties, about five homicides per 100,000 population (see Figures 3 and 4.) The two rates continued to be similar throughout the fifties and early sixties. In fact, if you lay one graph over the other, you will find that the two rates overlap and are difficult to distinguish from each other until the mid-sixties. After 1964, however, there is a sharp demarcation between the two series.

Although homicide rates in both metropolitan and non-metropolitan counties increased in the late sixties and early seventies, metropolitan rates increased much more rapidly. In 1963, both rates were less than five homicides per 100,000 population, but by 1974, the metropolitan rate was higher than eleven, while the non-metropolitan rate was still less than eight. Similarly, they both declined after 1974, but the decline in metropolitan counties was greater.

Does the rapid increase in metropolitan homicide rates in the sixties and early seventies account for the rapid increase nationally? In other words, can we specify the total homicide rate pattern by urban residence? Certainly, the general pattern of rapid increase followed by a rapid decrease after 1974 appears to be much stronger in metropolitan than non-metropolitan counties, but this overall pattern can be seen in both types of homicide. Therefore, we cannot say that metropolitan residence explains the pattern of change in the sixties and seventies in the total rate of United States homicide. On the other hand, this comparison of patterns does suggest that we should look for some particular type of homicide, occurring in both metropolitan and non-metropolitan counties but more frequently in metropolitan counties, that would specify the national pattern.
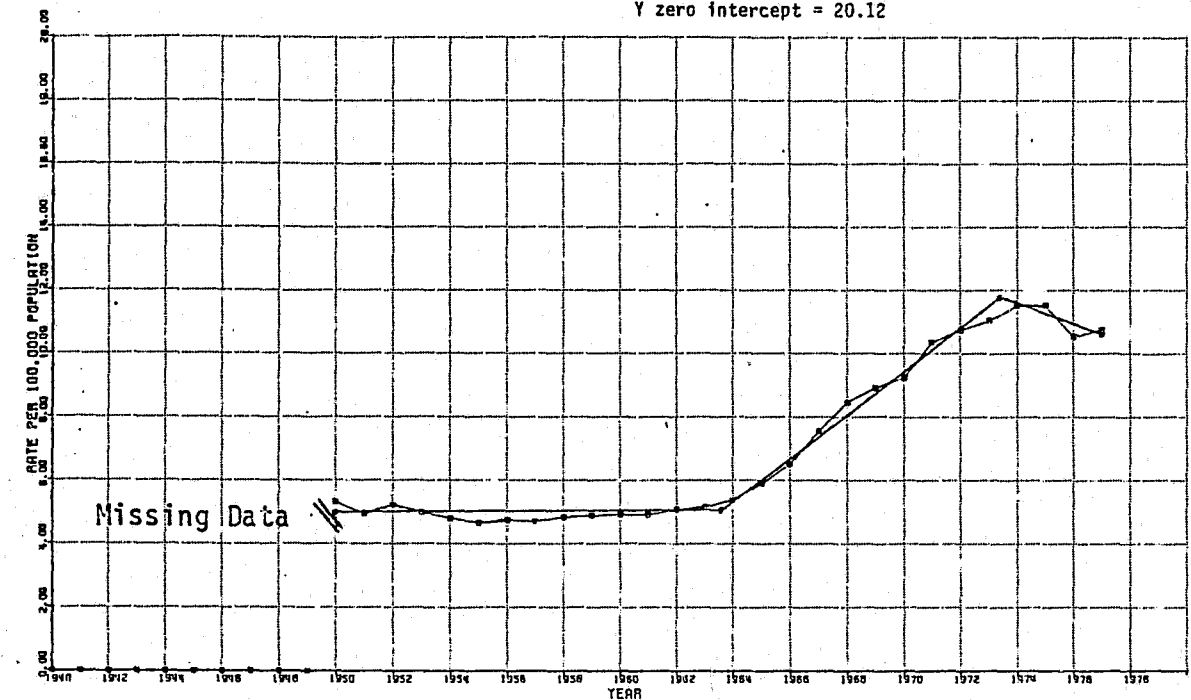
Figure 3

HOMICIDE RATES, METROPOLITAN COUNTIES, 1940-1977

SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS. HOMICIDES INCLUDE ALL INSTANCES OF PERSONS KILLED BY ANOTHER PERSON, AS REPORTED TO CORONERS OR MEDICAL EXAMINERS. THIS INCLUDES JUSTIFIABLE HOMICIDES.

First Slope = 0.00
Y zero intercept = 4.95
Second slope = 0.68
Y zero intercept = -4.87
Third slope = -0.34
Y zero intercept = 20.12

First turning point x:14.50
Y:4.98
Second turning point x:24.50
Y:11.77

Total SSR = 1.33

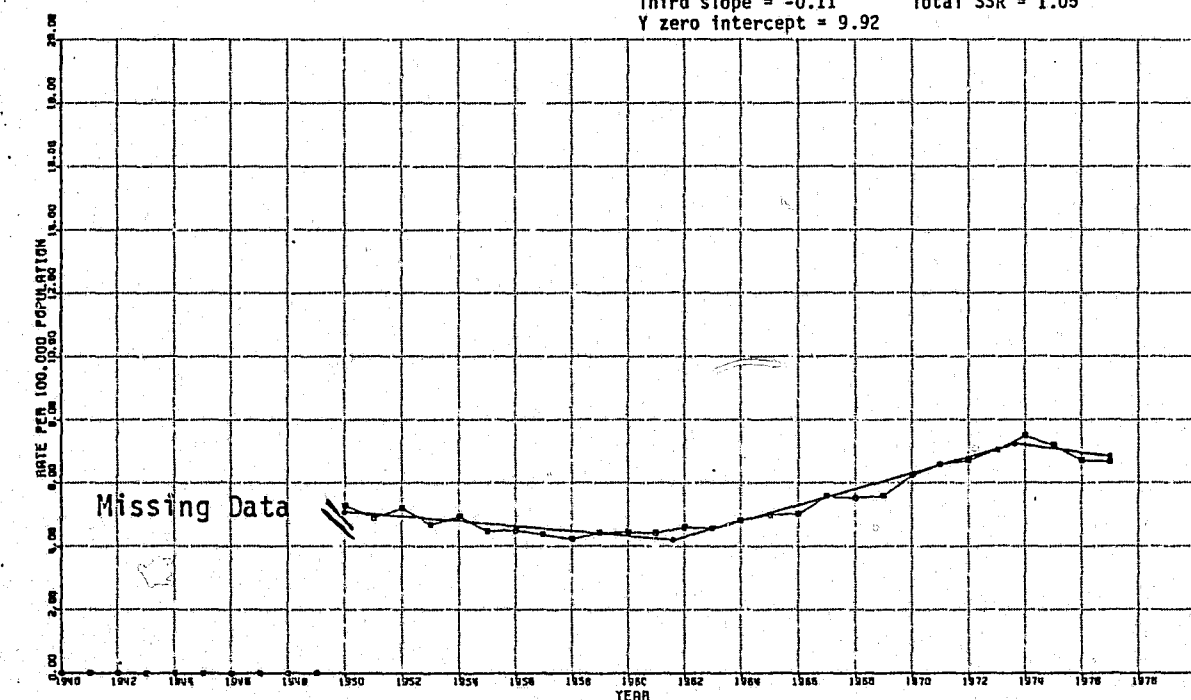ILEC CRIMINAL JUSTICE INFORMATION SYSTEMS-
STATISTICAL ANALYSIS CENTER GRAPH

Figure 4

HOMICIDE RATES, NON-METROPOLITAN COUNTIES, 1940-1977

SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS. HOMICIDES INCLUDE ALL INSTANCES OF PERSONS KILLED BY ANOTHER PERSON, AS REPORTED TO CORONORS OR MEDICAL EXAMINERS. THIS INCLUDES JUSTIFIABLE HOMICIDES.

First slope = -0.08
Y zero intercept = 5.19
Second slope = 0.25
Y zero intercept = 1.06
Third slope = -0.11
Y zero intercept = 9.92

First turning point x:12.50
Y:4.16
Second turning point x:24.50
Y:7.13

Total SSR = 1.05

ILEC CRIMINAL JUSTICE INFORMATION SYSTEMS-
STATISTICAL ANALYSIS CENTER GRAPH

Race of the Victim

There are two immediately obvious differences between the patterns over time of age-adjusted homicide rates of white victims and nonwhite victims (see Figures 5 and 6.) First, the rates for nonwhite victims are much higher than the rates for white victims. In many years, the difference between the two is a factor of ten. (Note that, for this reason, the scale of these two figures is not the same as the scale of the other graphs in this report.)

Second, the pattern over time of age-adjusted homicide rates of nonwhite victims is very similar to the pattern over time of the total age-adjusted United States rates. Both generally decrease from 1940 to the early sixties, with some fluctuation during and after World War II. Both climb rapidly in the sixties and early seventies, and begin to decline in the mid-seventies. However, the increases and decreases are more extreme for homicide rates of nonwhite victims than for the nation as a whole. Nonwhite victim rates increase more rapidly in the sixties and early seventies, and the decrease in the mid-seventies is more rapid and begins earlier.

On the other hand, the pattern over time of age-adjusted homicide rates of white victims is very smooth, and changed comparatively little over the period. Although it gradually increased from the mid-fifties to the mid-seventies, the increase was very slight, never rising above eight per 100,000 population. During the same period, however, the nonwhite victim homicide rate increased from about 25 to over 45 per 100,000. Although the nonwhite victim homicide rate declined very rapidly after 1972, the white victim homicide rate pattern shows no decrease at all. Also, the pattern of white victim homicide rates does not show a fluctuation around World War II, while the pattern of nonwhite victim homicide rates does.

Thus, the pattern of homicide rates in the United States from 1940 to 1977 seems to be specified by the race of the victim. Although this does not explain the rapid increase of United States homicide rates in the sixties, and the rapid decrease after 1974, it does narrow the search for an explanation. We now know that, to explain the pattern of homicide rates in the United States, it is first necessary to explain the pattern of homicide rates of nonwhite victims. Therefore, future analysis of the patterns of United States homicide rates from the forties to the eighties should focus on the patterns of homicides of nonwhite victims.
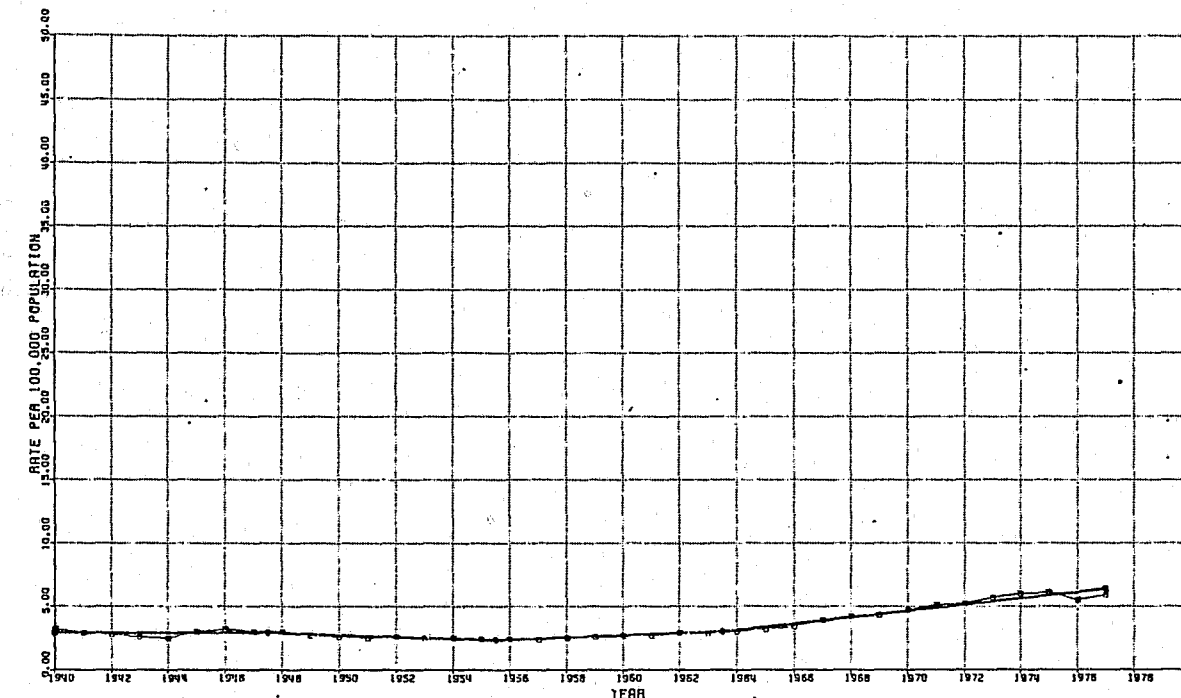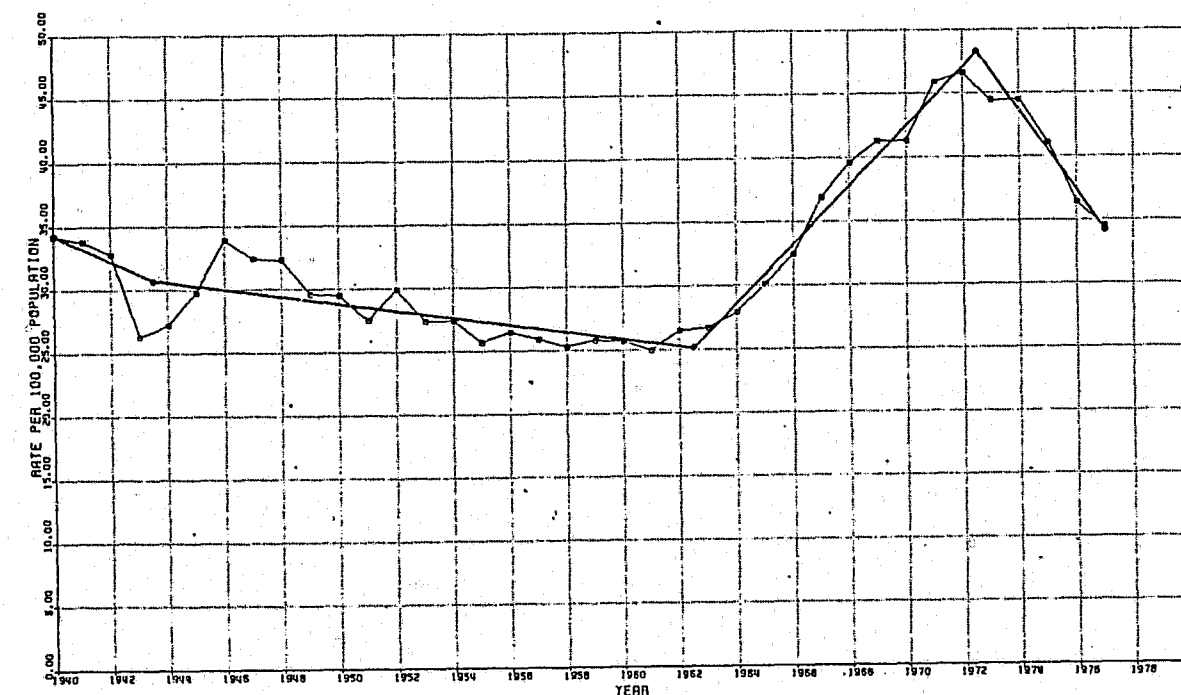
U.S. AGE-ADJUSTED HOMICIDE RATES, WHITE VICTIMS, 1940-1977

Figure 5

ILEC CRIMINAL JUSTICE INFORMATION SYSTEMS –
STATISTICAL ANALYSIS CENTER GRAPH

U.S. AGE-ADJUSTED HOMICIDE RATES, NONWHITE VICTIMS, 1940-1977

Figure 6

ILEC CRIMINAL JUSTICE INFORMATION SYSTEMS –
STATISTICAL ANALYSIS CENTER GRAPH

Area of the Country

Pattern descriptions of each of the nine census-defined geographical areas of the United States (see map, Figure 7) show that all of these areas have very similar patterns of homicide rates in the forties and the fifties. However, in the sixties and seventies, the patterns of some areas were quite different from the patterns of other areas.

Homicide rates in most areas of the United States decreased in the forties and fifties, but some areas decreased more than others, and some areas show greater World War II fluctuation than others. Except for the East South Central states (Figures 8 and 9,) which show a strong World War II fluctuation, and the Pacific states (Figure 10,) which show an increase, homicide rates in all areas of the United States generally decreased through the forties, and usually through the fifties as well. (The East North Central and West South Central states (Figures 11 and 12) did increase slightly in the early forties, but then decreased in the late forties and the fifties.) The most rapid decline in the forties occurred in the South Atlantic states (Figure 13.) The most rapid decline in the fifties occurred in the East South Central states (Figure 8.)
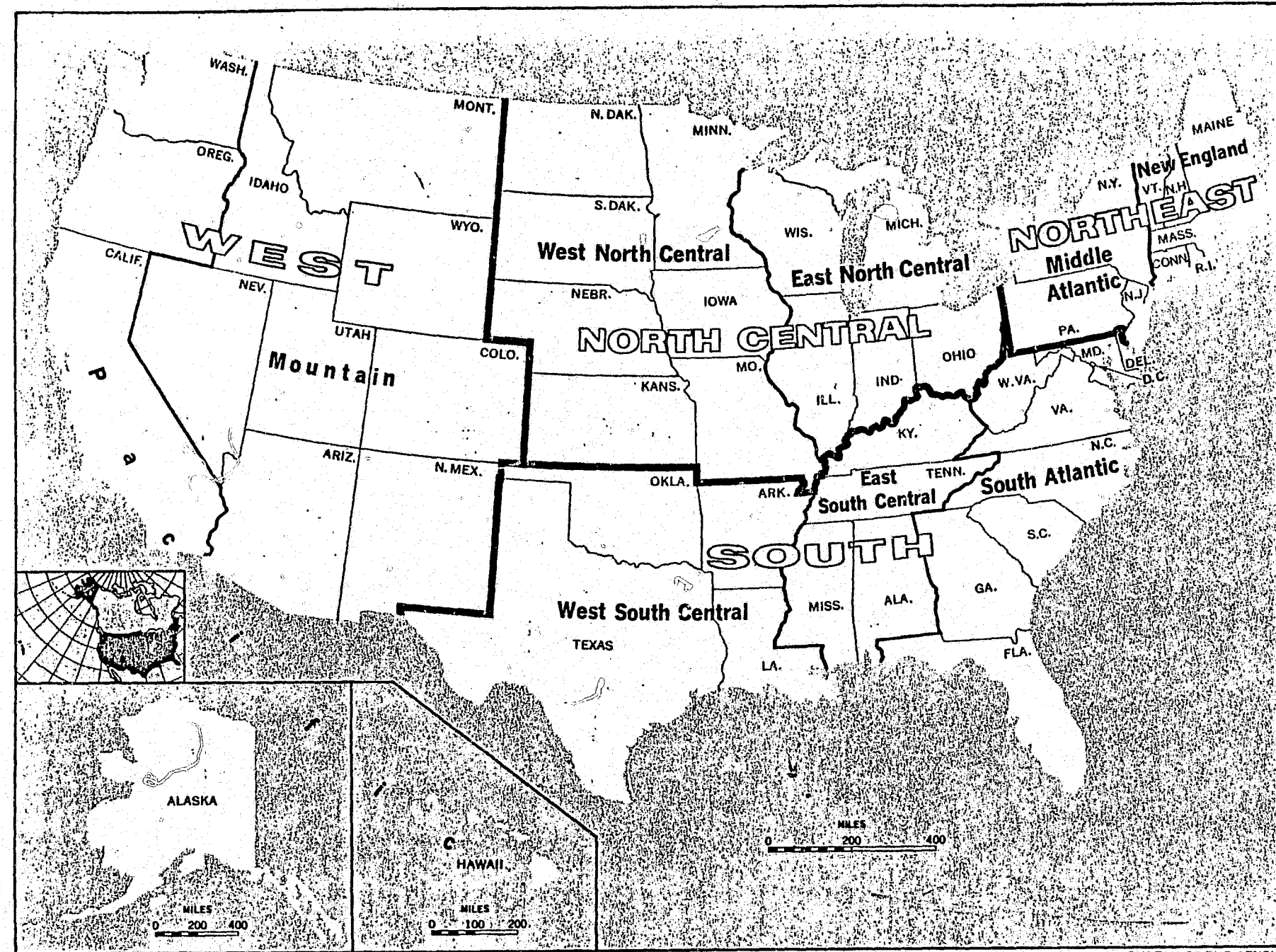
The apparent effect of World War II on homicide rates was concentrated mostly in one area--the East South Central states (Figure 8.) Although the homicide rate here declined rapidly in the forties and fifties, from about sixteen to about eight per 100,000 population, the decrease during the war years was even more rapid. This was followed by a brief but rapid post-war increase, despite the generally declining pattern. Some World War II fluctuation can also be seen in the West South Central states (Figure 12) and the South Atlantic states (Figure 13.) The fluctuations are small in the former area, but in the South Atlantic states, the best-fitting four segment line (Figure 13) shows a rapid decline during the war years.

Thus, homicide rates in all areas of the United States remained steady or declined in the forties and fifties, except for fluctuations during and after World War II, and except for the increase in the Pacific states. However, in the sixties and the seventies, the homicide rate patterns varied from one area of the country to another. The nine geographical areas seem to have followed one of four general patterns: a rapid increase in the sixties followed by a rapid decline in the mid-seventies; a rapid increase in the sixties followed by a levelling-off in the seventies; a continuous but slight increase; and a continuous rapid increase.

Homicide rates in the Middle Atlantic states (Figure 14,) the South Atlantic states (Figure 13,) and the West South Central states (Figure 12) all increased very rapidly from the mid-sixties to 1972 or 1973, and then decreased very rapidly. The pattern of homicide rates in the East South Central states (Figures 8 and 9) also fits this category, if we allow a change

7

Figure 7

CENSUS REGIONS AND GEOGRAPHIC DIVISIONS OF THE UNITED STATES

U.S. DEPARTMENT OF COMMERCE

BUREAU OF THE CENSUS

in our criterion for the maximum number of segments. Because of the strong World War II fluctuation, a six or a seven segment line fits the East South Central pattern much better than a four segment line. According to the Cp, a seven segment line (Figure 9) is the best description, and a six segment line is a close second. Both of these show a rapid increase in the sixties and early seventies and a rapid decline in the mid-seventies. Thus, in general, the homicide rates in the Middle Atlantic and southern areas of the United States increased rapidly in the sixties and seventies, and declined in the mid-seventies.

In contrast, although homicide rates in the East and West North Central and Mountain States (see Figures 11, 15 and 16) also increased more or less rapidly from the mid-sixties to the early seventies, they did not decline in the mid-seventies. Instead, the rate of increase levelled off. Homicide rates in all three of these areas were completely stable for over twenty years, from 1940 until 1963 or 1964, when they began to increase. The rate in the East North Central states more than doubled in less than ten years. The increase in the Mountain states was almost as great, while the increase in the West North Central states was somewhat less.

Homicide rate patterns in the New England states show a continuous, but slight, increase from 1958 to the end of the series, 1977. The two segment fit (Figure 17,) which shows no change at all from 1940 to 1958 and then the slight increase, is better, according to the Cp's, than a fit with more segments. Although the line segment fits do not show any indication of a decline in the mid-seventies, the 1976 and 1977 homicide rates are relatively low. If this continued to the eighties, it is possible that a subsequent analysis would show a decline.
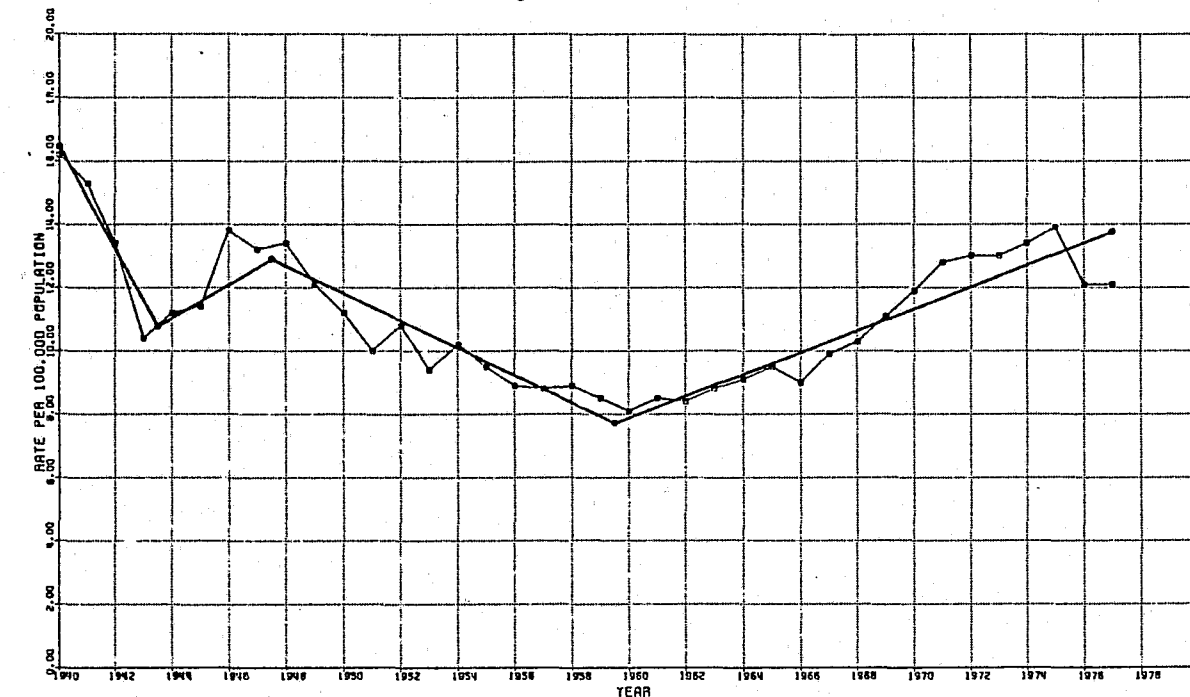
The pattern of homicide rates in the Pacific states (Figure 10) is unlike the pattern of any other area. Homicide rates increased slightly from 1952 to 1964, when rates in other areas of the United States were falling. After 1964, the homicide rate in the Pacific states increased continuously and rapidly. At the low point, in 1951, the homicide rate was a little less than three homicides per 100,000 population. By 1977, the rate was ten per 100,000 population. There is no indicaton at all of a decline in the seventies.

9

HOMICIDE RATES, EAST SOUTH CENTRAL STATES, 1940-1977

RAW DATA SERIES = □
MULTI-SEGMENT LINE = ⊙
SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS

Figure 8
Four Segment Fit

HOMICIDE RATES, EAST SOUTH CENTRAL STATES, 1940-1977

RAW DATA SERIES = □
MULTI-SEGMENT LINE = ⊙
SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS
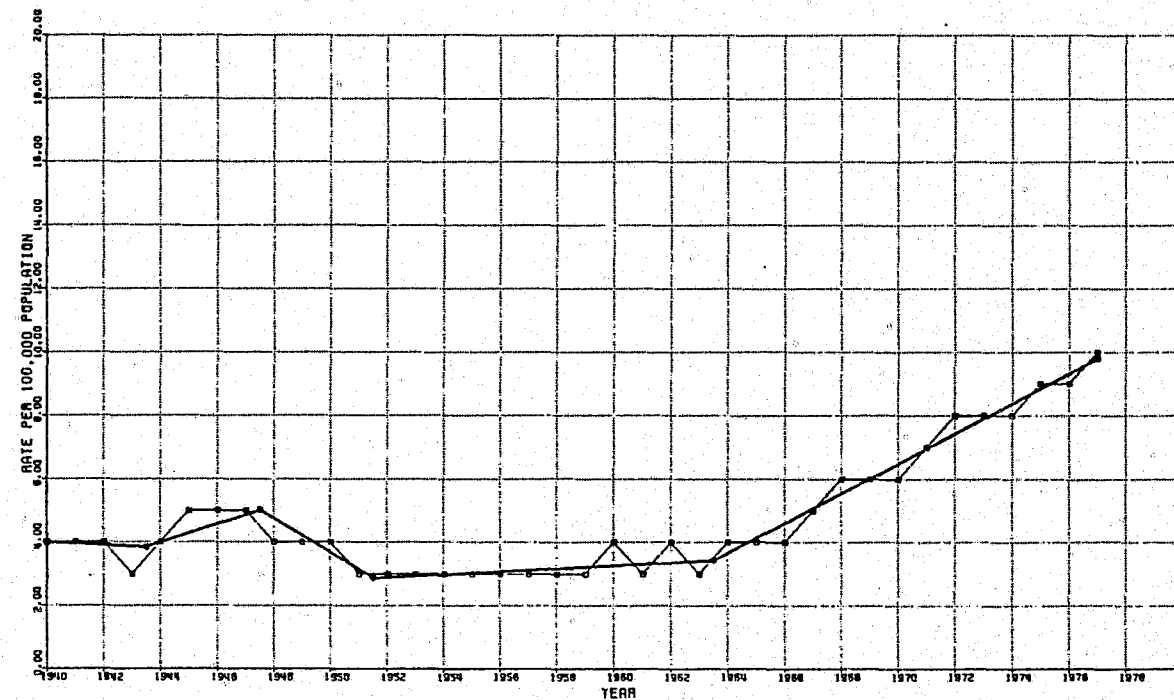

Figure 9
Seven Segment Fit

HOMICIDE RATES, PACIFIC STATES, 1940-1977

RAW DATA SERIES = □
MULTI-SEGMENT LINE = ⊙
SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS

Figure 10

FIRST SLOPE = -0.04
T ZERO INTERCEPT = 3.97
SECOND SLOPE = 0.29
T ZERO INTERCEPT = 2.01
THIRD SLOPE = -0.53
T ZERO INTERCEPT = 9.02
FOURTH SLOPE = 0.05
T ZERO INTERCEPT = 2.33
FIFTH SLOPE = 0.47
T ZERO INTERCEPT = -7.83

FIRST TURNING POINT X:3.50 T:3.83
SECOND TURNING POINT X:7.50 T:8.01
THIRD TURNING POINT X:31.50 T:2.87
FOURTH TURNING POINT X:29.00 T:3.43

TOTAL SSR = 5.12

RATE PER 100,000 POPULATION

YEAR

ILEC CRIMINAL JUSTICE INFORMATION SYSTEMS -
STATISTICAL ANALYSIS CENTER GRAPH

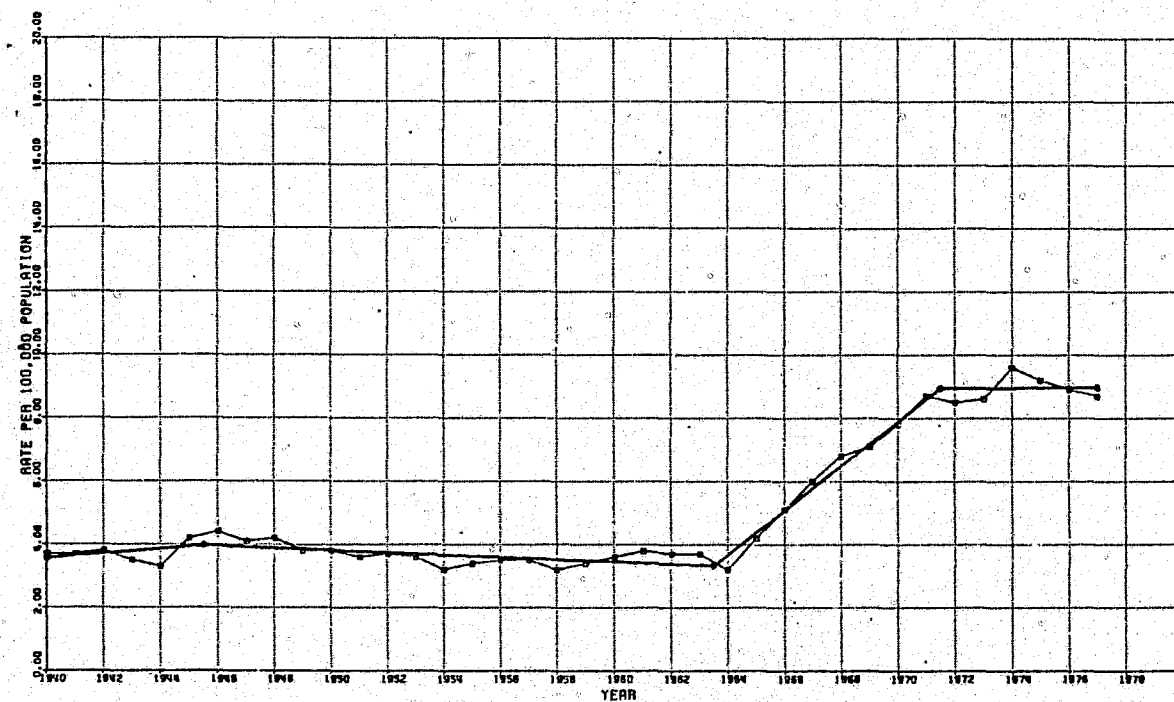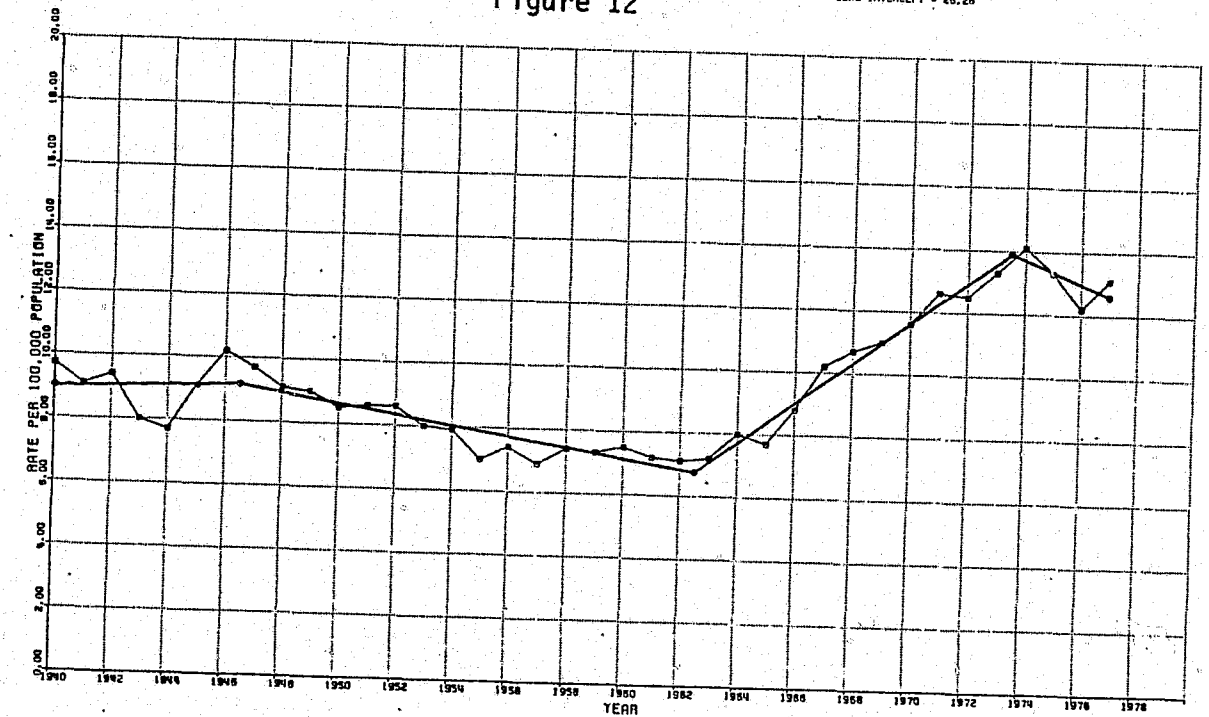## HOMICIDE RATES, WEST SOUTH CENTRAL STATES, 1940-1977

RAW DATA SERIES = □
MULTI-SEGMENT LINE = ⊙
SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS
HOMICIDES INCLUDE MURDER, MANSLAUGHTER, AND
JUSTIFIABLE HOMICIDES

Figure 12

FIRST SLOPE = 0.03
T ZERO INTERCEPT = 9.09
SECOND SLOPE = -0.15
T ZERO INTERCEPT = 10.14
THIRD SLOPE = 0.95
T ZERO INTERCEPT = -7.98
FOURTH SLOPE = -0.37
T ZERO INTERCEPT = 26.26

FIRST TURNING POINT X:8.50 T:9.16
SECOND TURNING POINT X:29.50 T:8.76
THIRD TURNING POINT X:33.50 T:13.89

TOTAL SSR = 8.42

RATE PER 100,000 POPULATION

YEAR

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STATISTICAL ANALYSIS CENTER GRAPH

HOMICIDE RATES, EAST NORTH CENTRAL STATES, 1940-1977

RAW DATA SERIES = □
MULTI-SEGMENT LINE = ⊙
SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS

Figure 11

FIRST SLOPE = 0.07
T ZERO INTERCEPT = 3.58
SECOND SLOPE = -0.04
T ZERO INTERCEPT = 4.10
THIRD SLOPE = 0.70
T ZERO INTERCEPT = -19.14
FOURTH SLOPE = 0.01
T ZERO INTERCEPT = 8.72

FIRST TURNING POINT X:5.50 T:3.95
SECOND TURNING POINT X:23.50 T:2.93
THIRD TURNING POINT X:31.50 T:8.93

TOTAL SSR = 2.87

RATE PER 100,000 POPULATION

YEAR

ILEC CRIMINAL JUSTICE INFORMATION SYSTEMS -
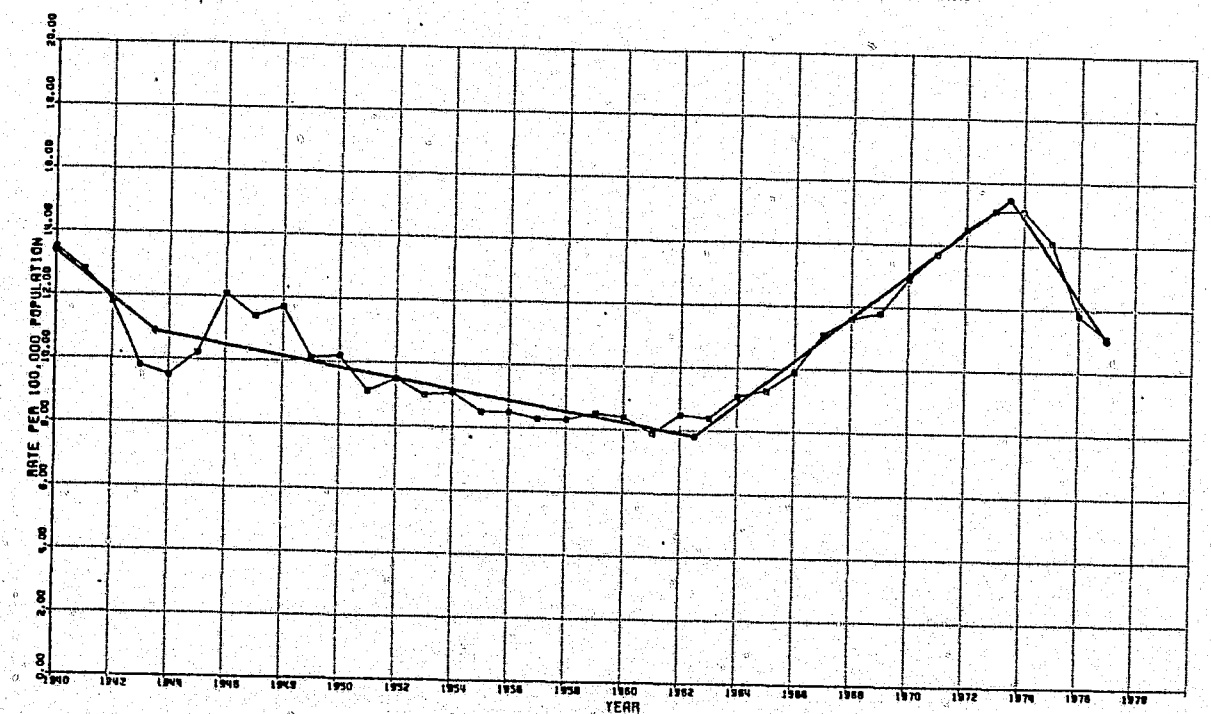STATISTICAL ANALYSIS CENTER GRAPH

HOMICIDE RATES, SOUTH ATLANTIC STATES, 1940-1977

RAW DATA SERIES = □
MULTI-SEGMENT LINE = ⊙
SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS

Figure 13

FIRST SLOPE = -0.71
T ZERO INTERCEPT = 19.90
SECOND SLOPE = -0.15
T ZERO INTERCEPT = 11.42
THIRD SLOPE = 0.89
T ZERO INTERCEPT = -7.81
FOURTH SLOPE = -1.27
T ZERO INTERCEPT = 57.85

FIRST TURNING POINT X:3.50 T:10.88
SECOND TURNING POINT X:29.50 T:7.81
THIRD TURNING POINT X:33.50 T:13.43

TOTAL SSR = 13.11

RATE PER 100,000 POPULATION

YEAR

ILEC CRIMINAL JUSTICE INFORMATION SYSTEMS -
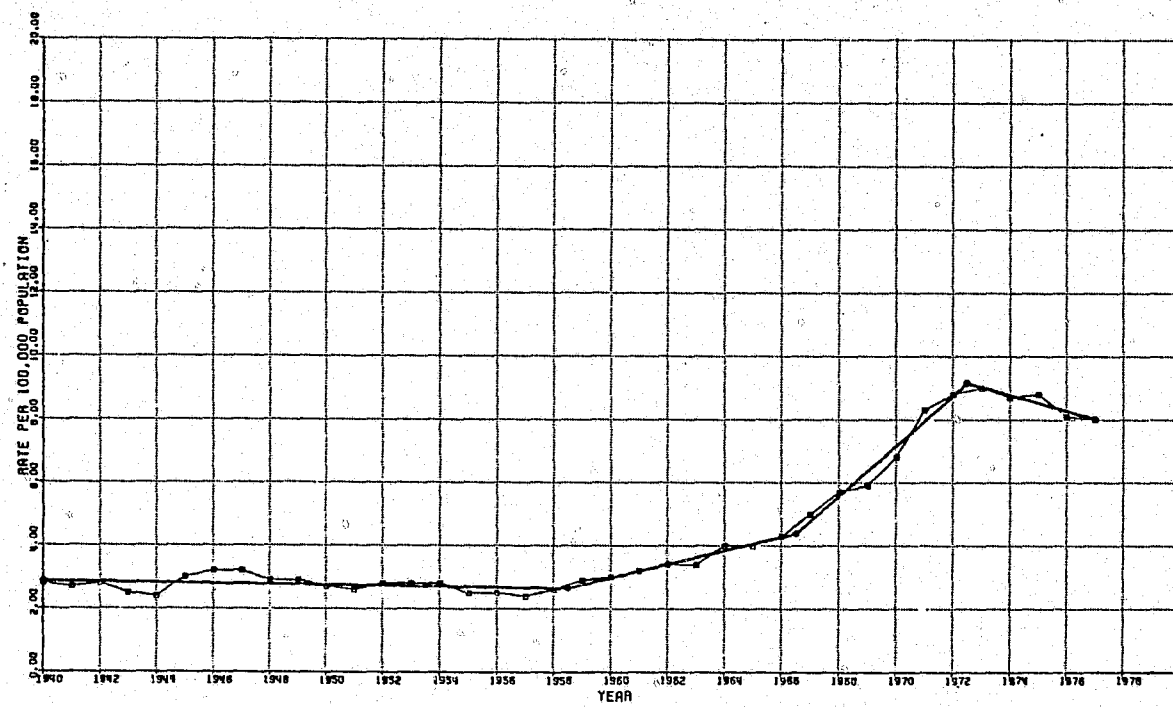STATISTICAL ANALYSIS CENTER GRAPH

Figure 14

HOMICIDE RATES, MIDDLE ATLANTIC STATES, 1940-1977
RAW DATA SERIES = □
MULTI-SEGMENT LINE = ○
SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS

FIRST SLOPE = -0.01
Y ZERO INTERCEPT = 2.85
SECOND SLOPE = 0.22
Y ZERO INTERCEPT = -1.36
THIRD SLOPE = 0.49
Y ZERO INTERCEPT = -18.70
FOURTH SLOPE = -0.25
Y ZERO INTERCEPT = 17.32

FIRST TURNING POINT   X=19.50 Y=2.86
SECOND TURNING POINT   X=29.50 Y=6.37
THIRD TURNING POINT   X=32.50 Y=8.14
TOTAL SSR = 1.85

ILEC CRIMINAL JUSTICE INFORMATION SYSTEMS -
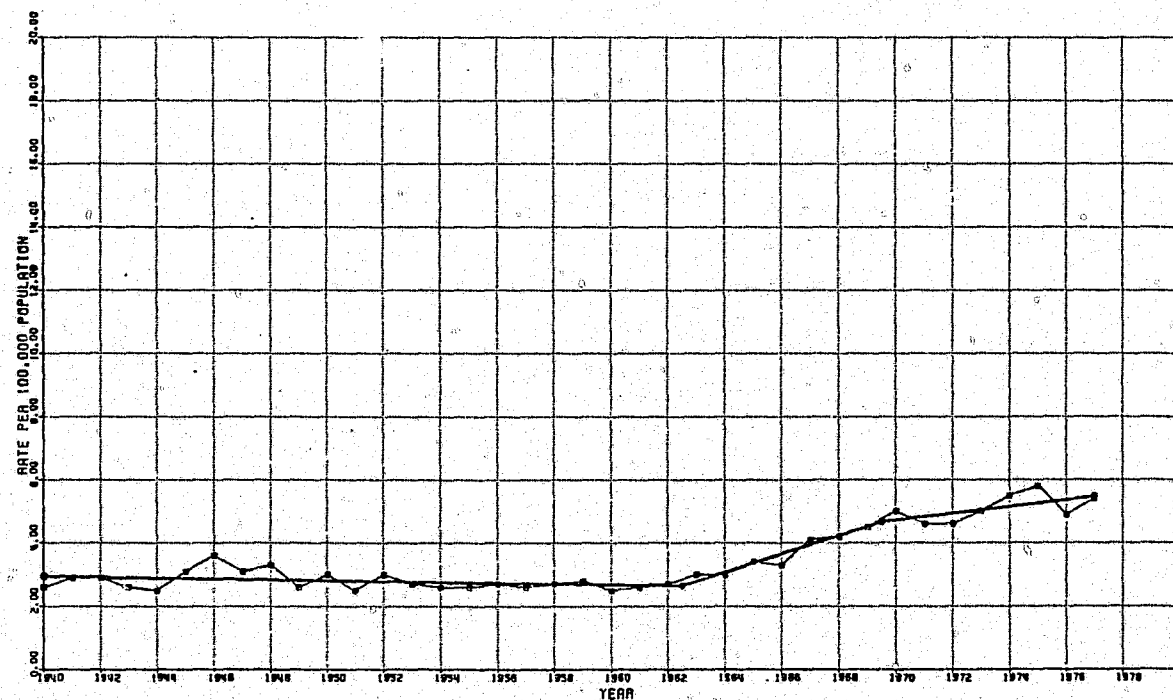STATISTICAL ANALYSIS CENTER GRAPH

Figure 15

HOMICIDE RATES, WEST NORTH CENTRAL STATES, 1940-1977
RAW DATA SERIES = □
MULTI-SEGMENT LINE = ○
SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS

FIRST SLOPE = -0.01
Y ZERO INTERCEPT = 2.84
SECOND SLOPE = 0.28
Y ZERO INTERCEPT = -3.04
THIRD SLOPE = 0.11
Y ZERO INTERCEPT = 1.48

FIRST TURNING POINT   X=22.50 Y=2.84
SECOND TURNING POINT   X=29.50 Y=4.88
TOTAL SSR = 2.85

ILEC CRIMINAL JUSTICE INFORMATION SYSTEMS -
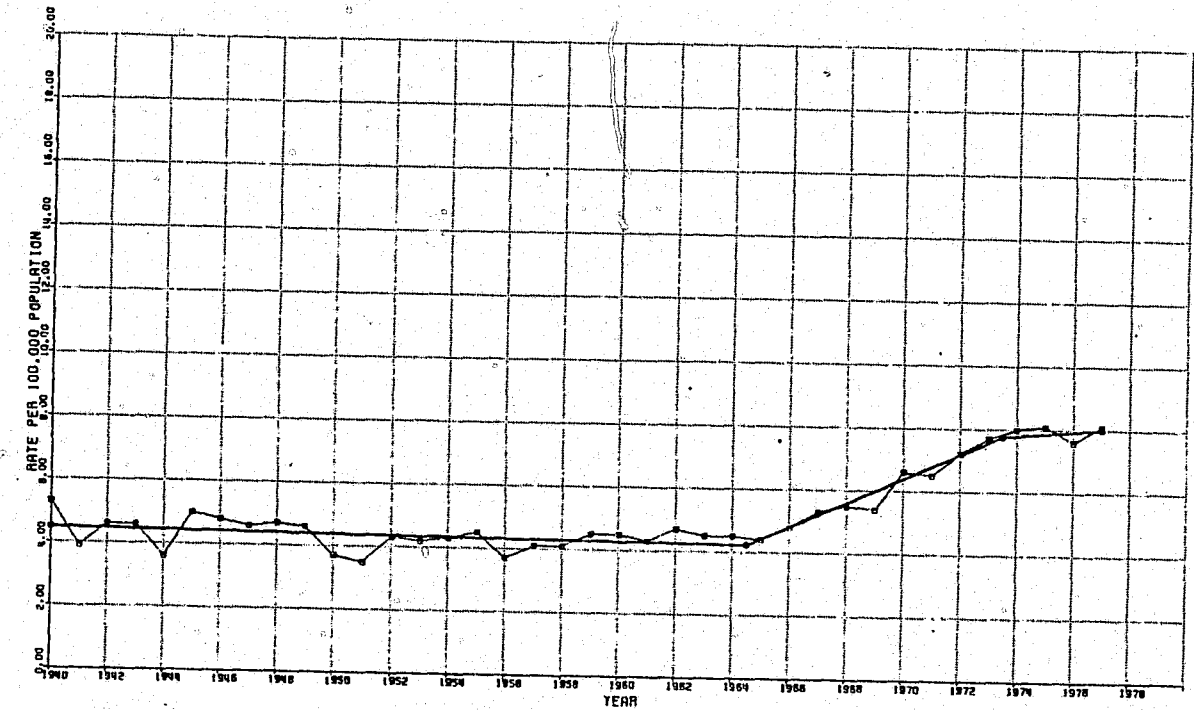STATISTICAL ANALYSIS CENTER GRAPH

HOMICIDE RATES, MOUNTAIN STATES, 1940-1977
RAW DATA SERIES = □
MULTI-SEGMENT LINE = ○
SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS

FIRST SLOPE = -0.01
Y ZERO INTERCEPT = 4.48
SECOND SLOPE = 0.39
Y ZERO INTERCEPT = -8.41
THIRD SLOPE = 0.07
Y ZERO INTERCEPT = 3.48

FIRST TURNING POINT   X=24.50 Y=4.28
SECOND TURNING POINT   X=35.50 Y=7.76
TOTAL SSR = 3.28

Figure 16

ILEC CRIMINAL JUSTICE INFORMATION SYSTEMS -
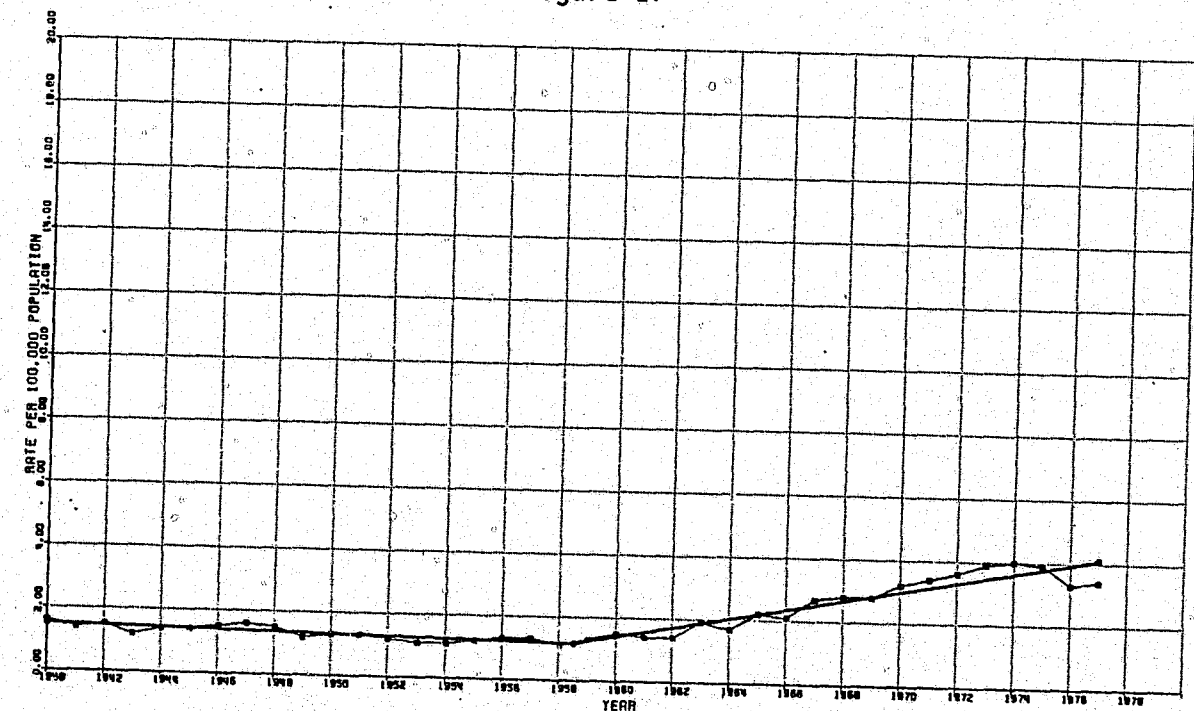STATISTICAL ANALYSIS CENTER GRAPH

HOMICIDE RATES, NEW ENGLAND STATES, 1940-1977
RAW DATA SERIES = □
MULTI-SEGMENT LINE = ○
SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS

FIRST SLOPE = -0.02
Y ZERO INTERCEPT = 1.50
SECOND SLOPE = 0.18
Y ZERO INTERCEPT = -1.70

FIRST TURNING POINT   X=18.50 Y=1.15
TOTAL SSR = 0.07

Figure 17

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STATISTICAL ANALYSIS CENTER GRAPH

Conclusions

Homicide rates in the United States (age-adjusted) generally declined slightly during the forties and early fifties (with some fluctuation around World War II,) increased slightly during the late fifties, increased very rapidly during the sixties, and then decreased beginning in the mid-seventies. This general pattern can be largely attributed to the pattern of homicide rates of nonwhite victims (age-adjusted.)

Although the rapid increase of homicide rates in the sixties and early seventies occurred throughout the country, the decline in the mid-seventies occurred only in the Middle Atlantic and southern areas of the country. Other areas of the country did not decline, and homicide rates in the Pacific states continued to increase rapidly through the seventies.

These conclusions must be considered tentative pending a separate pattern description of each raw homicide series and each corresponding population series. However, they do indicate that any future analysis of patterns of change in United States homicide rates during the period from the forties to the eighties should concentrate on an analysis of patterns of change in the homicide rate for nonwhite victims.

END