

CHANGES IN THE DISTRIBUTION OF POPULATION  
AND ITS EFFECTS UPON ARRESTS

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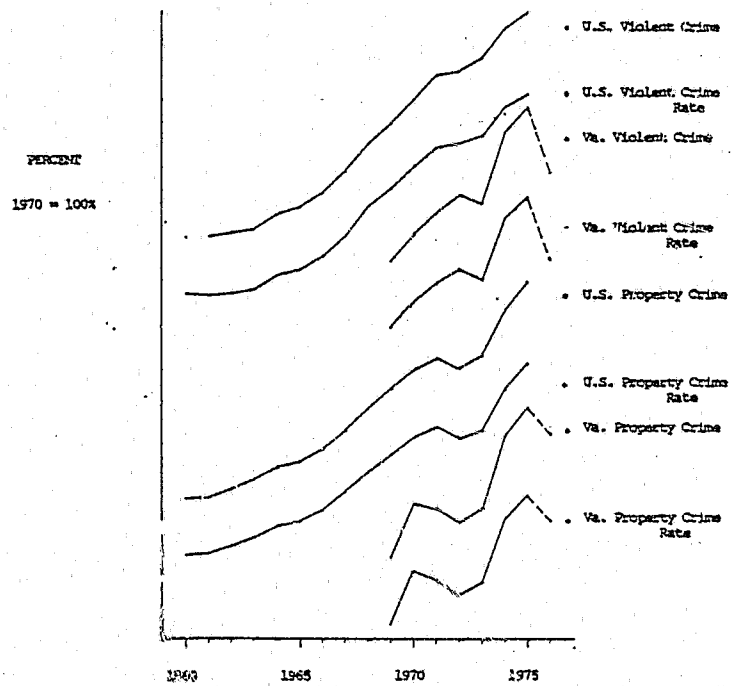
ACQUITTALS

During the first half of the 1970's, the Commonwealth of Virginia, as well as the United States in general, experienced a continuation in the rapid increase in crime which began in the late 1960's. Indicators of crime for the United States and Virginia, as shown in Figure 1, all show an increase in the slope of the graphs around 1965. This rapid growth of crime continues through 1970. These indicators, total index crimes and rates per 100,000 population, take a dip in 1972 and 1973 but the large increase in 1974 brings the graphs back into the approximate trend of the pre-1972 period.

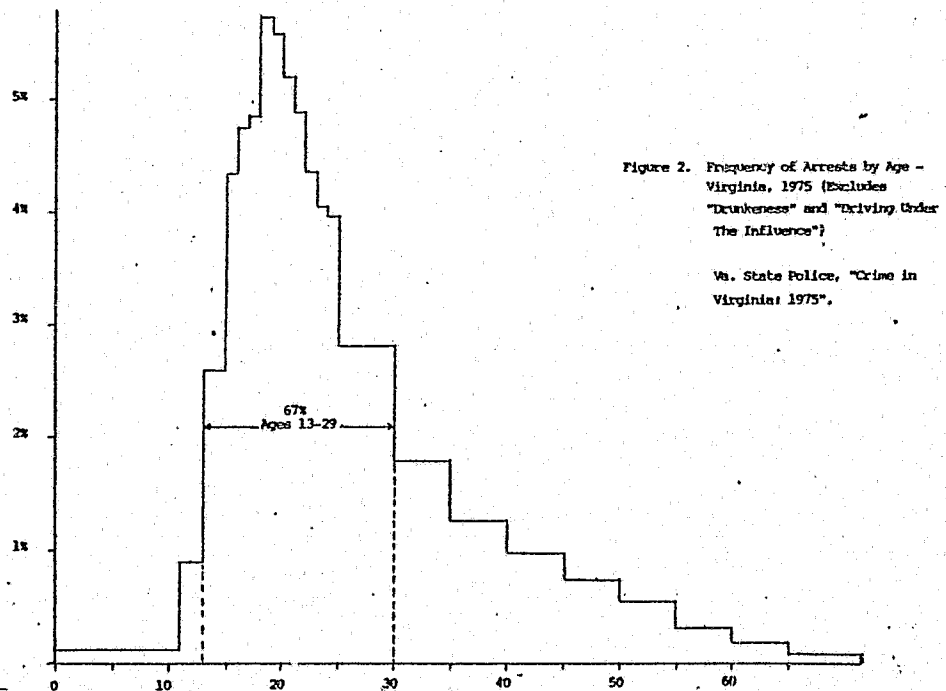
In most cases, these indicators are interpreted as great cause for alarm. Considering trends started in 1973 we might anticipate the immediate future to bring the greatest increases in crime in history. On the other hand, looking at general trends over the period of the graph, it appears the rate of growth of crime may be decreasing. Large steady increases in crime exist from 1965 to 1971, but trends established during this period, if extended, are all as high as or higher than actual indicators from 1972 to 1975. What influences are there to offer some insight into (1) the steep slope of the graphs during the period 1965 to 1975, (2) the dips in the graph for 1971, 1972, and 1973, (3) the changes in the slope between the years 1960-65, 1966-71, and 1971-75?

There have been a number of propositions addressing this question, but of major importance are (1) the impact of population growth in the crime prone age group and (2) several other

FIGURE 1. INDICATORS OF CRIME



F.B.I. "Crime in the United States", 1970 through 1975  
 Va. State Police, "Crime in Virginia", 1976, No. 13

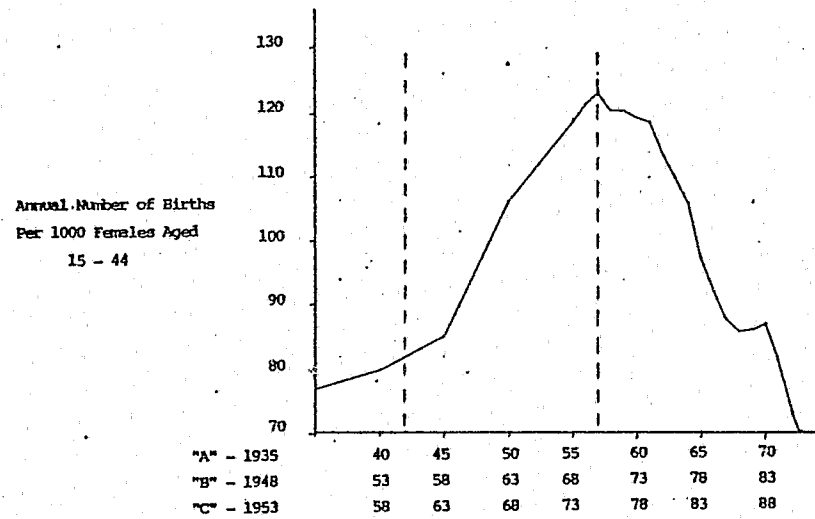


factors which have had an inflationary impact on crime statistics in the early 1970's. This paper examines the first proposition through the use of historical data, and the second in a more subjective manner.

First of all, what is the crime prone age group? The frequency distribution of arrests in Virginia in 1975<sup>1</sup>, Figure 2, illustrates that of every three arrests, two are ages 13 to 29. (These arrests do not include the offenses "public drunkenness" and "driving under the influence" which comprised 49% of all arrests aged 30 and above but only 15% of arrests under 30.) Further, the arrest rate for 13 to 14 year olds is very nearly equal to that for 25 to 29 year olds, both of which are significantly higher than rates for age groups under 13 and over 29. Nationally, according to Part I arrests reported to the FBI in 1975<sup>2</sup>, the arrest rates for persons under the age of 30 were 161% higher than those 30 and over for violent crimes and were 520% higher for property crimes. (This high rate of crime for teen-agers and young adults is also discussed by Wilson <sup>3</sup>, pp. 15-16, and Sutherland and Cressey <sup>4</sup>, pp. 121-126.) Thus for the purposes of this paper, the crime prone age group is defined to include the ages 13 to 29. Unfortunately, most population figures exist only in five year increments (ie: 10 to 14 years of age) and since arrests under 13 years are low, the risk factor for this group (10 to 14) conceals the high arrest rates of the 13 and 14 year olds.

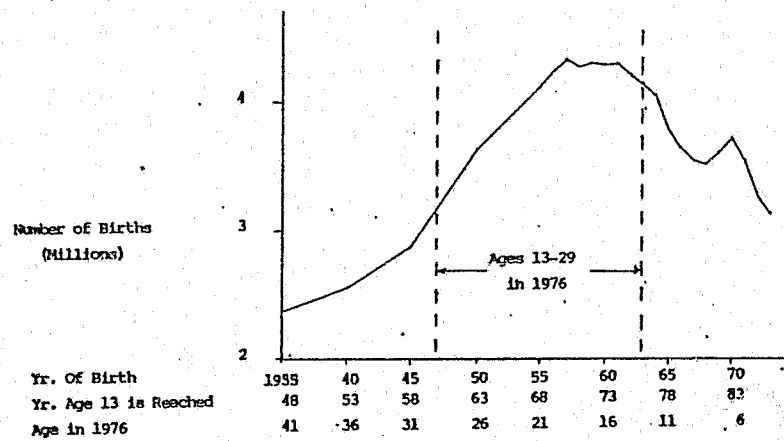
Figure 3 charts the general fertility rate measured by the number of births per year, per 1000 females ages 14 to 44<sup>5</sup>. The scale is adjusted in B to show the year age 13 is reached. Similarly,

FIGURE 3. GENERAL FERTILITY RATE



U.S. Bureau of the Census, "Statistical Abstract of the United States", 1971, 1973, 1974.  
Scale: "A" - Yr. of Births; "B" - Yr. Age 13 is Reached, "C" - Yr. Age 18 is Reached

FIGURE 4. TOTAL NUMBER OF BIRTHS BY YEAR



U.S. Bureau of the Census, "Statistical Abstract of the United States", 1971, 1973, 1974.

Scale C gives the year age 18 is reached. Note that during the period 1960 to 1975 on Scale C (indicated by dotted lines), the shape of this graph is generally the same as the graphs of the indicators of crime. Actually, if we consider 13 year olds by referencing Scale B, we find that since 1970 their rates have been decreasing. Figure 4 reveals the actual number of births by year<sup>5</sup>. If we adjust the scale here as with the fertility rates to reference 13 year olds we note that since 1970 the population of this group has ceased to increase and that since 1974 it actually has been decreasing. The third scale in Figure 4 shows ages reached in 1976 with the crime prone age group defined by dotted lines. It is clear that for two years the numbers entering this group have been decreasing.

Looking at Figure 4 again, one notes that while the population at the lower end of the high risk age bracket has begun to decrease, it is still increasing for ages 20 and above. In 1975 in Virginia, ages 13 to 19 accounted for half of all arrests (excluding alcohol) in the 13 to 29 year old group and one third of all non-alcohol arrests. Thus we would expect decreases in 13 to 19 year old population to have a more significant impact than proportional increases for the older age groups.

The first opportunity to determine the age of a suspect occurs at the time of arrest; however, no data of this type is available in published form for Virginia in 1970. For this reason the study was done using the United States data as reported in "Uniform Crime Reports"<sup>2</sup> and 6.

Table 1 was developed to demonstrate the impact of shifts in population upon overall crime rates. The approach used considered what would happen if the arrest rate within each age group remained constant during the period from 1970 to 1975. Total arrests, population and arrest rates are shown by age group for 1970 and 1975 together with 1975 projections based upon the foregoing. Further, a comparison is made between actual arrests, populations and rates by age group for the years 1970 to 1975.

The procedure used in building Table 1 first calculated 1970 arrest rates for each age group for which populations were available (5 year increments). This is shown in column D which is the quotient of arrests divided by population in 100,000's. The next step, under the assumption that rates within age groups remained constant, was to multiply 1970 rates by 1975 populations. The resulting arrest projections are shown in column F. These are compared with actual arrests in 1975 shown in column G. Note that U.C.R. arrests are adjusted to account for the fact that a number of states do not have mandatory reporting U.C.R. programs.

In 1970 ages 15 to 29 accounted for 24.5% of the total population. In 1975 this group contained 26.8% of the total population. During these five years, this age group experienced a 14.9% increase in population while the rest of the population increased by only 1.9%. This means we should have expected a 14.9% increase in crime from this group.

In 1970, the 15 to 29 age group accounted for 53% of all arrests. Simple arithmetic would reveal then, that if all other

Table 1. ANALYSIS OF ARREST RATES BY AGE GROUP

| Age    | A.<br>1970<br>UCR<br>Arrests <sup>1</sup> . | B = A/.74<br>1970<br>Adjusted<br>Arrests 2. | C.<br>1970<br>Pop. <sup>3</sup> . | D = B/C<br>1970<br>Arrest<br>Rate | E.<br>1975<br>Pop. 4. | F = D x E<br>1975<br>Projected<br>Arrests | G.<br>1975<br>UCR<br>Arrests <sup>5</sup> . | H = G/.832<br>1975<br>Adjusted<br>Arrests <sup>6</sup> . | I = H/E<br>1975<br>Arrest<br>Rate | 1970 - 1975<br>% Changes in |              |            |
|--------|---------------------------------------------|---------------------------------------------|-----------------------------------|-----------------------------------|-----------------------|-------------------------------------------|---------------------------------------------|----------------------------------------------------------|-----------------------------------|-----------------------------|--------------|------------|
|        |                                             |                                             |                                   |                                   |                       |                                           |                                             |                                                          |                                   | Arrests                     | Rates        | Population |
| 0- 4 ] | 78020                                       | 105432                                      | [ 171.67                          | 285                               | [ 181.62              | 101118                                    | 79160                                       | 95144                                                    | 268                               | -9.8                        | -6.0         | -4.3       |
| 5- 9 ] |                                             |                                             | [ 198.88                          |                                   | [ 173.18              |                                           |                                             |                                                          |                                   |                             |              |            |
| 10-14  | 529113                                      | 715018                                      | 208.00                            | 3438                              | 200.62                | 689732                                    | 637046                                      | 765680                                                   | 3817                              | 7.1                         | 11.0         | -3.5       |
| 15-19  | 1701259                                     | 2298999                                     | 193.01                            | 11911                             | 209.43                | 2494521                                   | 2262750                                     | 2719651                                                  | 12986                             | 18.3                        | 9.0          | 8.5        |
| 20-24  | 1136971                                     | 1536447                                     | 171.92                            | 8937                              | 194.04                | 1734135                                   | 1581737                                     | 1901126                                                  | 9798                              | 23.7                        | 9.6          | 12.9       |
| 25-29  | 647010                                      | 874388                                      | 136.87                            | 6388                              | 173.12                | 1105891                                   | 934240                                      | 1122885                                                  | 6486                              | 28.4                        | 1.5          | 26.5       |
| 30-34  | 481092                                      | 650124                                      | 115.70                            | 5619                              | 138.02                | 775534                                    | 611474                                      | 734945                                                   | 5325                              | 13.0                        | -5.2         | 19.3       |
| 35-39  | 442801                                      | 598380                                      | 111.74                            | 5355                              | 116.04                | 621394                                    | 467240                                      | 561587                                                   | 4840                              | -6.2                        | -9.6         | 3.8        |
| 40-44  | 443873                                      | 599828                                      | 119.82                            | 5006                              | 111.17                | 556517                                    | 402791                                      | 484124                                                   | 4355                              | -19.3                       | -13.0        | -7.2       |
| 45-54  | 684692                                      | 925259                                      | 232.87                            | 3973                              | 235.63                | 936158                                    | 643509                                      | 773438                                                   | 3282                              | -16.4                       | -17.4        | 1.2        |
| 55-64  | 320831                                      | 433555                                      | 186.51                            | 2325                              | 198.67                | 461908                                    | 290138                                      | 348724                                                   | 1755                              | -19.6                       | -24.5        | 6.5        |
| 65-up  | <u>104187</u>                               | <u>140793</u>                               | <u>201.77</u>                     | <u>698</u>                        | <u>221.70</u>         | <u>154747</u>                             | <u>95391</u>                                | <u>114653</u>                                            | <u>517</u>                        | <u>-18.5</u>                | <u>-25.9</u> | <u>9.9</u> |
|        | 6569849                                     | 8878174                                     | 2048.79                           | 4334                              | 2153.24               | 9631655                                   | 8005467                                     | 9621957                                                  | 4469                              | 8.4                         | 3.1          | 5.1        |

1. F.B.I., "Crime in the United States; 1970", Washington, D.C., 1971 Table 28, pp. 126-127 is based upon reports from 5270 agencies representing a population of 151,604,000 or 74% of the total (204,879,000 see 2.).

2. The Adjustment assumes the 5270 agencies represent a 74% random sample of the entire population.

3. U.S. Bureau of the Census, "Statistical Abstract of the United States: 1973", (94th Edition) Washington D.C., 1973. Table No. 3, pp.6-7.

4. Ibid

5. F.B.I., "Crime in the United States: 1975", Washington D.C., 1976, Table 36, pp. 188-189 is based upon reports from 8051 agencies representing a population of 179,191,000 or 83.2% of the total (215,324,000, see 6.).

6. The Adjustment assumes the 8051 agencies represent a 83.2% random sample.

factors were held constant, a 14.9% increase in 53% of the crime would result in 701,765 additional arrests in 1975, all in the 15 to 29 age group. These arrests amount to a net increase in crime of 7.9% due to the increase in size of the crime prone age group alone.

Actually, there were 743,783 more arrests in 1975 than in 1970. The projected increase from Table 1 is 753,481 when the effects from all age group shifts are summarized.

If arrest rates had remained constant within age groups, shifts in population from group to group would have resulted in a net increase of 753,481 or 8.5%. The overall arrest rate would have increased by 139 or 3.2%. This compares almost identically with actual figures; the difference is one tenth percent. These arrest totals from Table 1 are shown below.

|                     | <u>ARRESTS</u>         | <u>ARRESTS PER</u><br><u>100,000 POPULATION</u> |
|---------------------|------------------------|-------------------------------------------------|
| 1970 Actual Arrests | 8,878,174 <sup>1</sup> | 4334                                            |
| 1975 Actual Arrests | 9,621,957 <sup>3</sup> | 4469                                            |
| Actual Increase     | 743,783                | 135                                             |
| Percent Increase    | 8.4%                   | 3.1%                                            |
| 1975 Projected Arr. | 9,631,655              | 4473                                            |
| Projected Increase  | 753,481                | 139                                             |
| Percent Increase    | 8.5%                   | 3.2%                                            |

Table 1 demonstrates that through an analysis of population distribution increases in crime should have been anticipated. Ac-

tual data shows although rates within age groups did not remain constant, decreases in the over 30 groups tended to offset increases in the crime prone ages and the resultant net increase in crime may be attributed to population shifts.

The economic situation in this country, especially high unemployment, impacts the crime prone age group more than others. Because of this, their increase in arrest rates seems understandable.

But what of the decreases in population of the 13 to 14 year old ages and what of the jumps in crime indicators for 1974 and 1975? The dips in the graphs of the indicators during 1971, 1972, and 1973 coincide with a leveling off and later decreases in the number of people entering the crime prone age group.

If the theorized effect of population distribution were accurate, one would expect that crime indicators would have remained at 1970 to 1972 levels or in fact to have established a downward trend. Thus, some explanation of the jumps in 1974 and 1975 must be offered. It is unfortunate that the explanations do not lend themselves to the application of actual numbers as in the population analysis of Table 1. However, at least the direction of the influence can be determined.

First, there are the effects of implementation at the state level of mandatory U.C.R. programs. Virginia's effective date was January 1, 1975. During the implementation, agencies begin establishing the new procedures necessary to satisfy reporting requirements in advance of the deadline. This would tend to inflate reports of crime over and above any actual increases dur-

ing 1974 and 1975.

Throughout the country the impact of mandatory U.C.R. programs can be seen from the growth in the number of states having these programs.

STATES OPERATING MANDATORY U.C.R. PROGRAMS

| <u>YEAR</u> | <u>NEW</u> | <u>TOTAL</u> |
|-------------|------------|--------------|
| 1971        |            | 13           |
| 1972        | 1          | 14           |
| 1973        | 8          | 22           |
| 1974        | 10         | 32           |
| 1975        | 4          | 36           |

In 1973 and 1974 the number of states having these programs increased by 128%. The implementation of mandatory U.C.R. reporting in these states correlates with the increases in indicators during 1973, 1974, and 1975.

A second inflationary influence was the release of military personnel after the war in Vietnam. From 1970 to 1975, 4,986,000 males aged 15 to 29 were added to the target age group for an increase of 5.1%. Of this increase, 1,016,000 or 1.05% was due to a decrease in non-civilian population.

The third factor having a tendency to move the crime indicators higher than population analysis might explain are the effects of recession, inflation and unemployment mentioned earlier via its impact upon the crime prone ages. These generally are positively correlated with crime although the precise causitive relationships are somewhat speculative at this time.

The forth factor is that in 1973 the definition of Larceny - Theft was broadened to eliminate the \$50 lower limit. The graph of indicators has been corrected based upon 1972 and 1973 figures reported by the FBI, still, this is an approximation. It is probable that full implementation of this redefinition in some of the thousands of agencies reporting U.C.R. data was delayed. This means that a larger proportion of reporting agencies had fully implemented the redefinition in 1974 for the full year than had in 1973. Thus the assumption of full compliance in 1973 would tend to inflate 1974 data.

Finally, while the number of 13 year olds entering the crime prone age group has been holding steady since 1970 and decreasing since 1974, the population of the 20 to 29 year old group has continued to increase as the peak of the boom births moves into the 20's. This explains even more of the increase in crime from 1970 to 1975.

Looking to the future then for several years the increase in populations of the 20 to 29 year old group may cause their total number of arrests to increase. These arrests will be offset to some degree by the decreases in the population of 13 to 19 year olds. Because of disproportionate arrests for these groups, (Figure 4) the decreases for 13 to 19 year olds will at some point exceed increases in the older groups (20-24 and 25-29) resulting in a net overall decrease. In 1980, the population reductions will begin to impact the 20 to 24 year old group and the initial wave of the boom (1945-50 births) will be older than 29 years.

In summary then, it appears that primarily because of large

increases in population of the crime prone age group coupled with poor economic conditions in the period 1965 to 1975 we have experienced a significant rise in crime. There are indications that crime has begun to level off as the growth rate of the crime prone age group decreases. This leveling off has been concealed to some degree by improvements in the efficiency of crime reporting, delayed entry into the target age group of released military personnel, and delayed total compliance with the redefinition of Larceny - Theft.

Monthly U.C.R. reports for Virginia during 1976, in fact, support these conclusions as they show a steady downward trend in crime (Figure 2, dotted lines). From the foregoing discussion, there seems to be every reason to believe that this trend will continue.

1. Commonwealth of Virginia, Department of State Police, "Crime in Virginia: 1975", Richmond, Virginia, 1976.
2. F.B.I., "Crime in the United States: 1975", Washington, D.C., 1976.
3. Wilson, James Q., "Thinking About Crime", Basic Books, Inc., New York, 1975.
4. Sutherland, Edwin H. and Cressey, Donald R., "Criminology", J. B. Lippincott, Philadelphia, 1974.
5. United States Bureau of the Census, "Statistical Abstract of the United States: 1973", (94th Edition), Washington, D.C., 1973.
6. F.B.I., "Crime in the United States: 1970", Washington D.C., 1971.



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