Population Concentration in Indiana

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The size and character of the population vary enormously from one place to another. This is a fundamental fact of human geography. One of the basic objectives of human geography must be a better description and understanding of geographical variations in population density. Toward this end, I have been using the state of Indiana as a laboratory. In years past I have discussed with this group the distribution of the rural nonfarm population (1), migration and population change (2), rural population density (3), changing census concepts of rural population (4), and the major components of population distribution (5).

This paper is an outgrowth of the preparation of a series of maps of the distribution of the population of Indiana, and its principal residential components, as revealed by the 1960 Census of Population. These maps are based on unpublished data for minor civil divisions and census tracts (6). Separate maps have been prepared for the density, by township, of the total population, the urban population, and the rural farm population. The rural nonfarm population has been divided into those people who live in incorporated places of less than 2,500, which are here called "non-urban places," and the remainder of the rural nonfarm population.

The density maps of urban population and of rural nonfarm population outside incorporated places have remarkably similar geographical patterns. These are not the patterns of uniform regional density with which geographers are most familiar, however. They are what I have previously referred to as "point-oriented" patterns (5). Isolated townships or small groups of townships with very high densities are separated by groups of townships with relatively low but uniform density.

I have previously demonstrated a similar congruency of pattern at the county level, and concluded that the distribution of the urban population appears to be an important determinant of the distribution of the rural nonfarm population outside incorporated places (1). The finer grid provided by data at the township level demonstrates this effect far more forcibly. It is my purpose here, therefore, to examine the relationship between population concentrations in urban places and the distribution of various residential components of the population at the township level.

Concentrations of Population

The population of Indiana is indeed remarkably concentrated within a few townships. More than ten percent of the people of Indiana live in the two most populous townships, which occupy only one-third of one percent of the state's total area. The seven most populous townships occupy only one percent of the state, but they contain more than one-quarter of all the state's people. And eighteen townships,

which occupy less than two percent of the total area, have two-fifths of all the people.

The twenty most populous townships are all associated with metropolitan areas or major cities. Five are in and around Indianapolis, three are in the Gary-Hammond area, two are at Evansville, and one each is at Fort Wayne, South Bend, Muncie, Terre Haute, and New Albany. The non-metropolitan centers associated with most populous townships are Anderson, Kokomo, Richmond, Lafayette, and Elkhart, each of which has a population of more than 40,000 people.

If the link between metropolitan/urban areas and population concentration is so close, one might reasonably ask why we bother with township data when we might more easily use data for the metropolitan/urban areas defined by the Bureau of the Census. For example, fifteen of the twenty most populous townships are within the eight Urbanized Areas of Indiana. These eight Urbanized Areas have a total population of 1,891,765 people, or 186,826 more than the fifteen townships.

The answer is provided by the other five most populous townships, which contain 256,619 people, or 33,608 more than the five cities of Anderson, Kokomo, Richmond, Lafayette, and Elkhart. When one compares data for smaller cities with the data for the townships within which they are located, it becomes increasingly apparent that the population concentration associated with the city has spilled over into the adjacent township. We must therefore use data for townships rather than for incorporated places if we wish to understand the relationship between population concentrations and population distribution.

The reason, of course, is the simple fact that most cities have outgrown their political boundaries, and the real city covers a territory considerably larger than the area within the city limits. The Bureau of the Census is fully aware of this fact, and it has defined Urbanized Areas or "real city" areas, for cities which have 50,000 people or more (7). The Urbanized Area consists of the city plus an urban fringe of closely settled territory, which may include both incorporated places and unincorporated areas.

The entire population of the Urbanized Areas is classified as urban. In 1960 the urban fringes, or overspill areas, of the eight Urbanized Areas in Indiana had 14,567 people in incorporated places of less than 2,500 persons and 252,923 people who lived in unincorporated areas. But for the fact that they lived on the closely settled fringe of a city of 50,000 or more, all of these 267,490 people would have been placed in the rural nonfarm classification by the Bureau of the Census.

Although overspill is not restricted to cities of 50,000 or more, the Bureau of the Census unfortunately has not been able to delimit Urbanized Areas for cities of less than 50,000 people. The fringe population of these cities thus remains in the category of rural population. For example, a person who lives only a few yards outside the limits of a city of 49,999 people is classified as a rural person for census purposes. He automatically becomes an urban person when the population within the city limits reaches 50,000 people, or when the city expands its limits to annex the area within which he lives.
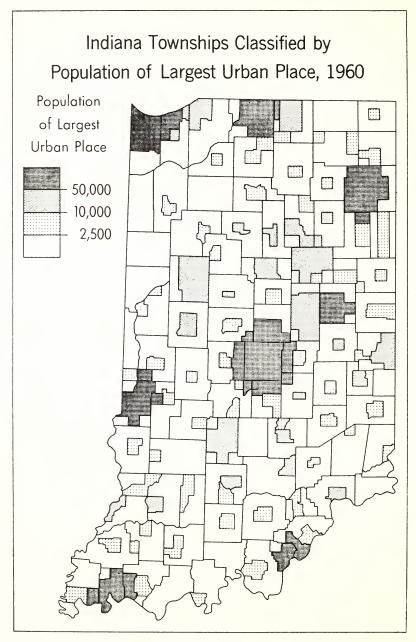
Figure 1. Classes of Indiana townships

Distribution of the Residential Components

The size of the largest place within each township provides a basis for grouping Indiana's 1,009 townships into four categories (Fig. 1). Each township is placed in the highest category for which it can qualify. The first category includes townships which contain some part of an Urbanized Area, plus one tier of contiguous townships. The second includes townships which contain some part of a city of ten to fifty thousand people, plus the contiguous tier. The third includes townships containing a city of 2,500 to 10,000 people, while the fourth and lowest category contains no place as large as 2,500.

For convenience, these groups might be thought of as metropolitan, city, town, and rural townships. The metropolitan group includes 102 townships and 10.1 percent of the state's land area. The city group has 83 townships and 8.3 percent of the area, while the town group has 78 townships and 9.8 percent of the area. The remaining 746 rural townships have 71.8 percent of the state's area.

The total population of all townships in each category has been tabulated in terms of its four residential components: urban, non-urban places, remaining rural nonfarm, and farm (Table 1). The distribution of these residential components in the different size-of-largest-place township categories must be examined from three distinct viewpoints:

TABLE 1

Distribution of the Population, by Place of Residence, when Townships Are Grouped by the Size of Their Largest Urban Place

Place of Residence	Size of Largest Urban Place			Townships with no Urban Place	The State
	50,000 or more	10,000 to 50,000	2,500 to 10,000		
Number of Persons					
Urban	1,920,860	653,059	336,372	————	2,910,291
Rural nonfarm	300,255	233,756	109,701	622,974	1,266,686
Non-Urban places	30,479	42,825	13,894	245,256	332,454
Remainder	269,776	190,931	95,807	377,718	934,232
Rural farm	47,259	41,485	49,358	347,372	485,474
Total	2,268,374	928,300	495,431	970,346	4,662,451
Percentage of Total for Size of Place					
Urban	84.7	70.4	67.9	0.0	62.4
Rural nonfarm	13.2	25.1	22.1	64.0	27.2
Non-Urban places	1.3	4.6	2.8	25.2	7.1
Remainder	11.9	20.5	19.3	38.8	20.1
Rural farm	2.1	4.5	9.9	36.0	10.4
Total	100.0	100.0	100.0	100.0	100.0
Percentage of Total for Place of Residence					
Urban	66.0	22.4	11.6	0.0	100.0
Rural nonfarm	23.8	18.5	8.7	49.0	100.0
Non-urban places	9.2	12.9	4.2	73.7	100.0
Remainder	28.8	20.4	10.3	40.5	100.0
Rural farm	9.7	8.5	10.2	71.6	100.0
Total	48.7	19.9	10.6	20.8	100.0

first, density variations, in terms of numbers of persons per square mile; second, the distribution of the residential components within each size of place category; and third, the concentration of the residential components in the different size of place categories.

Two aspects of the density distribution merit attention. First, although the urban and rural nonfarm densities decline predictably with size of place, the farm population density is remarkably uniform in all four size categories. Secondly, the city townships have an appreciably greater non-urban place density than the metropolitan townships. Many places on the city fringes have incorporated to avoid annexation. Such places are included in the Urbanized Areas of cities of 50,000 or more. The Indianapolis Urbanized area, for example, has 8,905 people living in incorporated places of less than 2,500, but these people are classified as urban because they are within the Urbanized Areas. They would be classified as rural nonfarm people if they lived on the fringe of a city of less than 50,000 people for which no Urbanized Area had been defined.

Turning to the distribution of residential components within each size of place category, it is notable that at least two-thirds of the people in each urban category are city-dwellers, and most of the rest are in the rural nonfarm category (Table 1). The lower percentage of rural nonfarm people in metropolitan townships is due in part, once again, to the existence of Urbanized Areas. Those people who would be classified as rural nonfarm if they lived on the fringe of a city of less than 50,000 are classified as urban because they live within the Urban Fringe of the urbanized area.

Less than two-fifths of the people of rural townships are farmers, whereas a quarter of these people live in incorporated places which are not considered urban because they have less than 2,500 people (Table I). Roughly two-fifths of the people of rural townships apparently are rural nonfarm people who live in the open country, but this might be misleading because of the vagaries of incorporation (8). A considerable, but indeterminate, proportion of these people actually live in villages which have chosen not to incorporate. The failure of these villages to incorporate means that no separate data are published on the size of their population.

Metropolitan townships have a disproportionate share of the urban and remainder rural nonfarm population (Table 1). When one remembers that these townships occupy only ten percent of the state's land area, it is obvious that they also have almost their share of the non-urban place and farm population. The city townships also have their proportionate share of each residential component of the population, and so do the town townships, apart from non-urban places. This low value for non-urban places may be due to the fact that a town of 2,500 to 10,000 is large enough to stifle competition from other places within its township, yet not large enough to have generated any dormitory villages.

The rural townships, which occupy 71.8 percent of the state, have their fair share by area of the rural farm people and the non-urban place people. At first glance they also appear to have more than their

share of the rural nonfarm population outside incorporated places, but one must remember that the townships in each of the first three size-of-place categories occupy roughly ten percent of the state's area. In terms of land area the row for remainder rural nonfarm would read ten-ten-ten seventy, whereas the actual percentages are thirty-twenty-ten-forty.

Six conclusions may be drawn from this examination of the relationship between population concentrations and the distribution of the various residential components of the population of Indiana in 1960:

1. Both the density and "intensity" (9) of the urban population increase with increasing size of place.

2. The density and intensity of the rural nonfarm population outside incorporated places also increase with increasing size of place.

3. The failure of the total rural nonfarm population to increase proportionately in metropolitan townships is largely due to the fact that a quarter of a million rural nonfarm people who live in Urbanized Areas are classified as urban people by the Census.

4. Townships containing cities of ten to fifty thousand people have a disproportionately large non-urban place population because Urbanized Areas are not delimited for cities of this size.

5. Unlike other residential components, the farm population has a relatively uniform and even geographic distribution.

6. The relationship between the geographical distribution of the farm population and the non-urban place population appears close enough to warrant further investigation.

These conclusions lead to one final summary conclusion: any attempt to describe, understand, and explain the complex geographical distribution of the population must be based in large measure on a full comprehension of patterns of population concentration.

Literature Cited

1. Hart, John Fraser. 1956. The Rural Nonfarm Population of Indiana. Indiana Academy of Science 65:174-179.

2. ——————. 1957. Migration and Population Change in Indiana. Indiana Academy of Science 66:195-203.

3. ——————. 1959. "Rural Population Density in Indiana." Indiana Academy of Science 68:218-224.

4. ——————. 1960. Census Concepts of Rural Population in Indiana. Indiana Academy of Science 69:249-253.

5. ——————. 1962. Some Components of Population Distribution in the Middle West in 1950. Indiana Academy of Science 71:210-218.

6. U. S. Bureau of the Census. 1962. U. S. Census of Population: 1960. Special Tables PH-2 and PH-3, Unpublished Sample Population and Housing Data for Minor Civil Divisions from the Census of Population and Housing.

7. U. S. Bureau of the Census. 1961. U. S. Census of Population: 1960. Vol. I, Number of Inhabitants: Report PC(1)-16A, Indiana, vi-vii.

8. Hart, John Fraser, and Neil E. Salisbury. 1965. Population Change in Middle Western Villages: A Statistical Approach. Annals of the Association of American Geographers 55: (in press).

9. Hart, John Fraser. 1960. The Changing Distribution of the American Negro. Annals of the Association of American Geographers 50:242-266, cf. p. 246.