

tion of these variables. The tables relate the average rate of change in the number of physicians in each of the county groups to (1) the average rate of population change, (2) the average level of absolute income in 1950, and (3) the rate of change of the average per capita income during 1950-1959. These national averages are simple arithmetic averages of state data, which in turn are weighted averages of county data within each county group. In the case of the 19 standard metropolitan areas, the averages are simple arithmetic averages, but the level of income of the population in 1959 is replaced by the average level of physician income in 1949, which adds a fourth variable to the analysis. The fifth variable is the degree of urbanization, which is treated as a qualitative variable. It could be included in the regression and correlation equations by means of dummy variables, but we chose the alternative of computing separate regressions and correlations for each county group⁷ and for 19 standard metropolitan areas. This has the effect in each case of keeping the degree of urbanization constant and provides a basis for comparison between urban and rural areas.

One of the obvious facts indicated by Table 3 is that the impact of the population and income variables depends greatly on the degree of urbanization. It is well known that the rural environment tends to discourage and the urban environment to encourage the location of physicians. There are many factors, especially differences in cultural and professional advantages, which account for this differential in drawing power. But here we are concerned only with variables that affect the income opportunities of physicians. To what extent do they have a differential impact in the different environments? We might like to know whether improved income opportunities would work in attracting more physicians to rural areas and roughly how much of an improvement would be required. Of course, our data can only give crude indications of what the answer to these questions might be.

Let us compare now the effects of our variables in the different environments. Column (b) of Table 3 shows the percentage increase in the number of physicians associated with a 1 per cent increase in population in the different county groups. On the whole the effect of population change is quite strong, but it varies greatly between areas. It is greatest in the adjacent areas, where a 1 per cent increase in population is associated with a 1.42 per cent increase in the number of physicians. Somewhat puzzling is the case of semi-rural areas, where a 1 per cent increase in population is associated with a .22 per cent decrease in the number of physicians. In lesser metropolitan areas, population and physicians tend to increase at the same rate, while in more urbanized areas the rate of physician increase is somewhat smaller than the rate of population increase, and in isolated rural areas it is much smaller. The basic distinction is clearly between rural and nonrural areas. Assuming the observed association to be of a causal nature, we could say that

⁷ A few counties changed from one group to another over the nine-year period in question, usually moving from lesser to greater urbanization categories. In these cases the county was included in the category which it occupied in 1950, on the assumption that its condition in the initial year had a greater impact than its classification at the end of the period. The total effect of such changes, however, is negligible since only 34 out of 3069 counties were involved.