

# COMMUNICABLE DISEASE CONTROL CONFERENCE

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CENTER FOR DISEASE CONTROL  
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## HEALTH PROBLEMS AND PROGRAMS FOR THE URBAN POOR

### SOCIOECONOMIC STRATIFICATION AS A TOOL FOR DISEASE CONTROL

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During the last three years, the Portsmouth, Virginia, Department of Public Health, with the assistance of the Center for Disease Control, has been investigating the use of socioeconomic stratification mapping techniques as a tool for disease modification and control. Discussing the techniques and accomplishments will illustrate its use.

We have felt for some time that discussion of disease in relation to race was of little value, yet most statistics on communicable disease, where differentiated by population groups, talk about problems in poor blacks as opposed to poor persons. It is our feeling that the problems are directly related to the economic situation and not to the race. We therefore set about differentiating the populations in our city by income level.

It was felt necessary to have the population groups as homogeneous as possible, and to have areas defined that would allow comparison with other epidemiologic studies. At the start of our program we picked census tracts as study units, since increasing amounts of data from other geographic areas are also based on census tracts. Also, we knew that the coming decennial census of 1970 would provide us some useful denominator data. The City Planning Department had just completed outlining the 1970 census tracts, and in most cases they were comprised of city neighborhoods with fairly homogeneous cultural groups. These same groups also had reasonably homogeneous income levels, although a few tracts had spots in them that were at one extreme or the other.

We looked at Federal "Poverty Guidelines" and reports of the National Health Surveys, and met with the City Planning Department. When looking at the ability to obtain routine medical care and preventive care services, we designated \$5,999 as the upper limit for the low-income groups, \$9,999 as the upper limit of middle-income groups. Family groups were defined as size four.

In addition to selecting census tracts on the basis of economics, we also looked at amounts of deterioration and dilapidation of dwelling units, the amount of police problems, the taxable value of homes, the amount of rental property, the age of school buildings, welfare case loads, surveys (made by the local newspapers) of socioeconomic conditions of the four lower Tidewater Cities, and areas slated for housing rehabilitation. We realized that there are many other variables of social and cultural achievement that

could be used, but we wanted to use those that were reasonably easy to define and to obtain data on.

With the use of this data, Portsmouth was divided into three areas of health expectation—high, middle, and low—corresponding to economic levels of the 32 census tracts in the city. There was approximately a third of the population in each area, a little less in the low-income area and a little more in the middle-income areas. The levels of housing in the three areas are as shown in Figure 1. The difference in dilapidation is very marked and shows similar patterns in many older cities.

Having defined the socioeconomic areas of the city, we looked at various disease data, including, but not limited to, venereal disease, tuberculosis, immunization levels, illegitimacy, infant deaths, and hepatitis.

The immunization levels were inadequate in all areas of the city but lowest in the low-income areas. (Figure 2 shows the status of measles immunization levels.) The use of immunization data enabled the health department to obtain the cooperation of the medical society and school health departments in arranging immunization against all the common childhood infectious diseases and brought the levels up to seventy-five percent or better

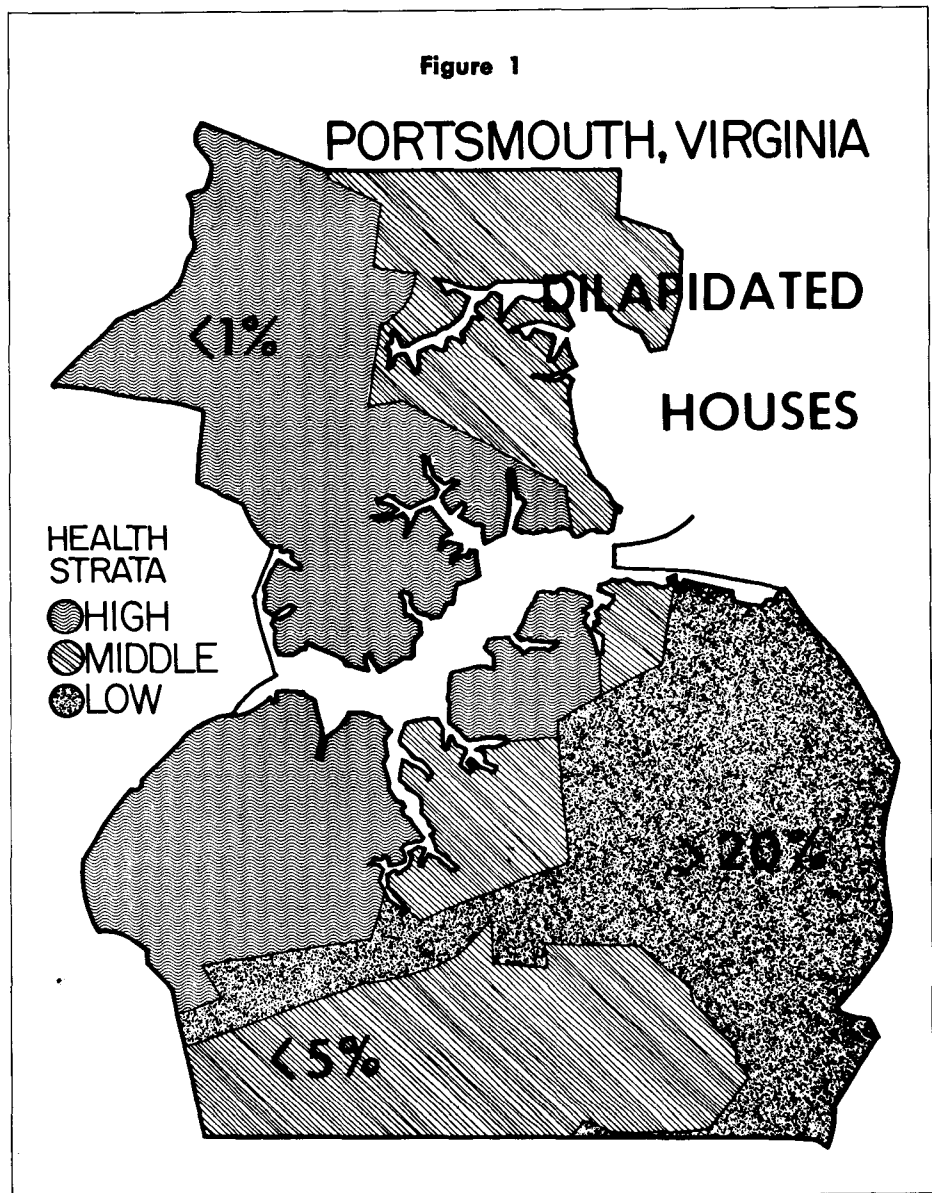
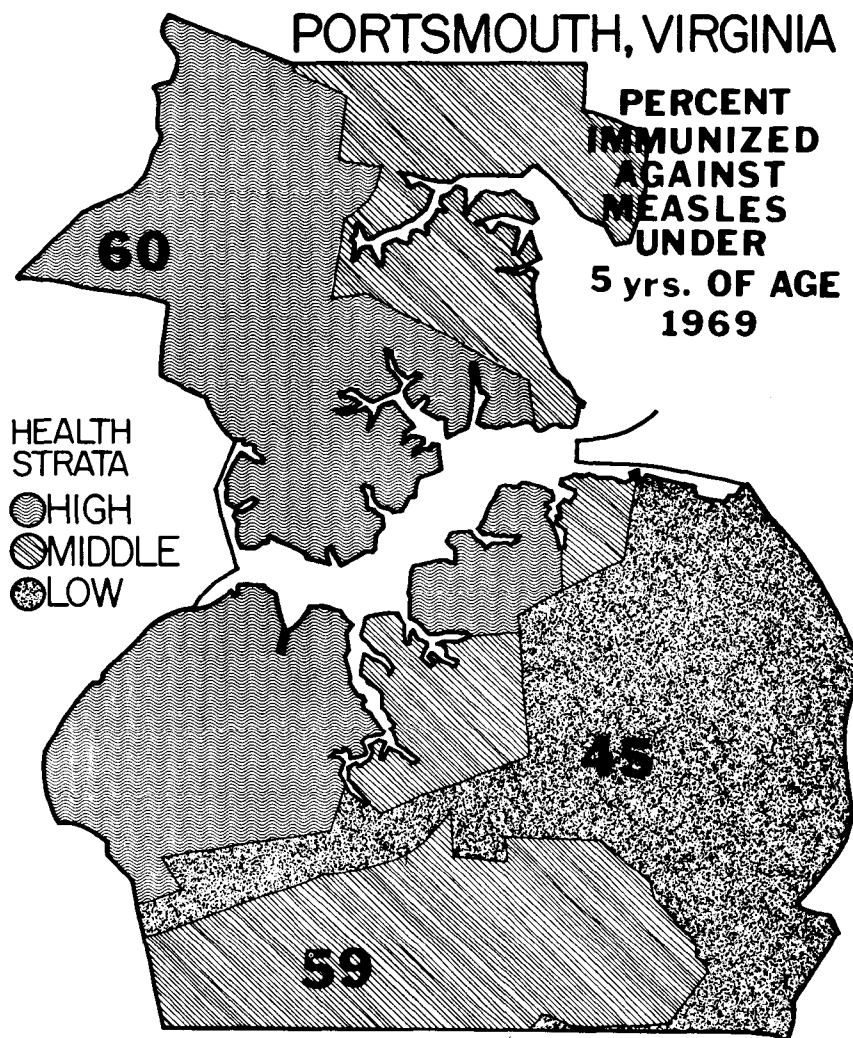


Figure 2



in the first four grades of school. Ideally we would have liked to have these levels by eighteen months of age. There is no reasonable way of monitoring or enforcing such a level in this age group of the population. We did feel it important that immunization levels not be allowed to drop to the previous ranges. The school board, upon the advice of the school physician, requested City Council to pass an ordinance requiring all school children to be properly immunized prior to entry into school. This was the first community in the State of Virginia to require such a step. During the present meeting (1972) of the State Legislature, this is being made a mandatory requirement statewide.

An immunization survey three months after opening of schools showed that, at the elementary level, all of the schools except three, out of a total of 11, were at a level of 75 percent immunized or higher. Of the three in the low economic areas, one was 55 percent immunized, one was 65 percent and one was 75 percent, and there were some individual immunization levels greater than 80 percent. It is expected that during the next school year all levels will be above 80 percent.

During the first year it was felt unwise to exclude unimmunized or incompletely immunized children from school but, rather, to ensure that they had completed their immunizations before the end of the school year. After a year of education and information, it is felt that we can be much firmer in our requirements. This procedure has worked better than the occasional "Measles Sunday," because a continuous high level of immunization is obtained at the time that large groups of children are starting to congregate together.

Infectious hepatitis was found to be minimal but present as recognized disease mostly in the low-income areas. Histories revealed that this was usually associated with eating raw shellfish. We have large areas of oyster and clam beds, some of which have been restricted for harvesting but which we believe are being illegally harvested and the restricted shellfish eaten illegally. At this time, other than ensuring administration of gamma globulin for close contacts, there is little we can do except attempt to educate people as to the risks they run.

Syphilis (Figure 3) shows marked localization to low-income areas, and the picture for gonorrhea, although much worse, is identical in distribution (Figure 4). Three general practitioners of the area have staffed our clinics for many years. Frank discussions with the physicians in town elicited that some patients are treated without being reported but that very few are unreported, because of the rapport between the practitioners and the health department. As a result of the distribution of copies of *Economic Distribution of Disease* to the schools, the newspapers, and City Council, we have finally obtained ap-

proval from the school health department for educational courses on the nature and prevention of venereal disease. We are also working with the Health, Welfare, and Planning Council to set up a citywide information program modeled after "Operation Venus."

Tuberculosis was found to be widespread throughout the city, in all areas being well above the state and national rates. The difference between high- and low-income areas was marked (Figure 5). The data, which showed the need for a concentrated attack on the disease, was used to stimulate the state to let our city be picked as a testbed for the optical scanning technique of data collection for the Tuberculosis Record System. The difference by age groups (Figure 6) was sufficient to show the need to concentrate on teenagers to find special high-risk groups.

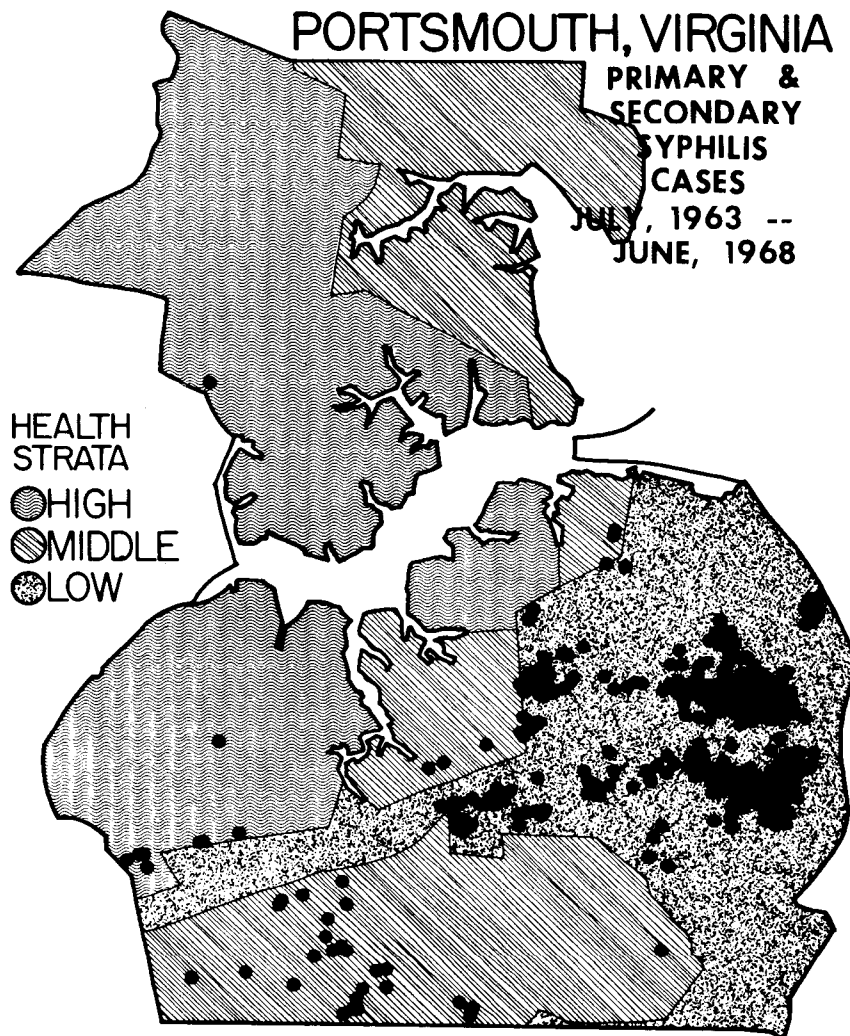
Testing in schools was inadequate because many students failed to accept skin testing. We tested patients in the various clinical programs, both general medical clinics and specialty clinics. We found that one out of five adolescents coming to the venereal disease clinics had positive TB skin-test reactions but without abnormal chest X-rays. The highest rate in other groups was one in twenty, and in such a group as food handlers it was about one in fifty. On further discussion of the epidemiology of initial (primary) infection, we came to realize that tuberculosis is spread in the teenage group during the intimacy of sexual activity when kissing takes place and sputum is exchanged, thereby transferring tuberculosis bacilli. Therefore we feel that tuberculosis disease prevention should be aimed at the very same group to which we give information regarding venereal disease. In fact, prevention of spread may be more difficult in tuberculosis than in venereal disease, since the prevention of tuberculosis disease requires 6 to 12 months of taking INH.

When we look at the tuberculosis cases, by area, in 1969 and in 1972 (Figure 7), it is obvious that we have moved a long way in a short period of time.

Instead of using 15 nurses part time, we are using 4 nurses, a supervisor, and 2 clerks full time. We are following 2,400 individuals instead of the 350 we followed in 1969. It is our feeling that with 6 extra nurses and 3 clerks, we could eradicate new cases of tuberculosis within 3 years. With our present computer systems of address matching, we could identify people moving into and within the community and eradicate tuberculosis. After 2 years of concentrated effort, we could return to the present staff level. We should skin-test everyone in the city, and doubtless would have to put some 10 to 12 thousand on INH for a year. The problem at this time is lack of funds to undertake the project.

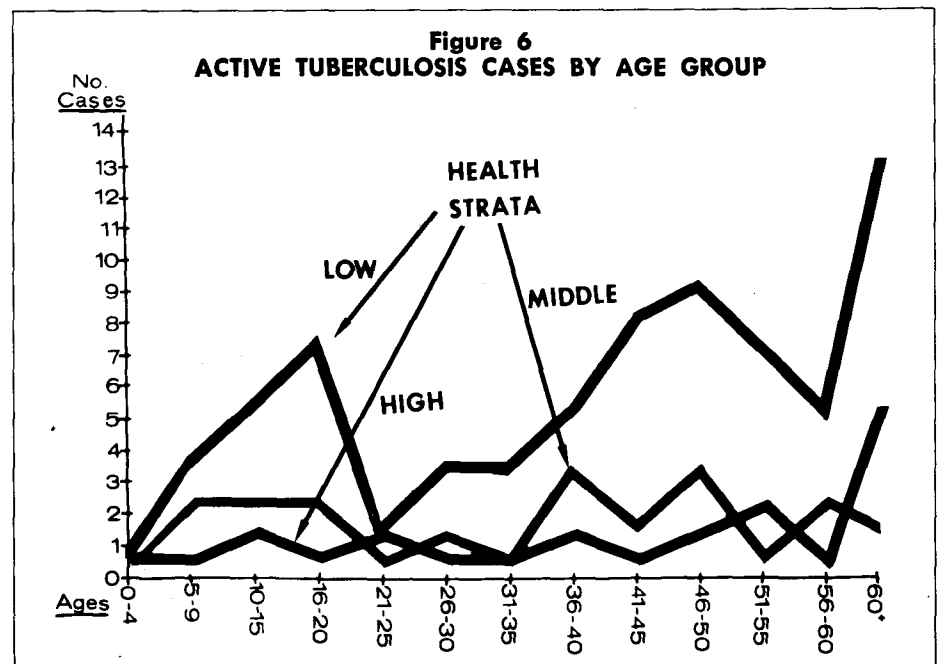
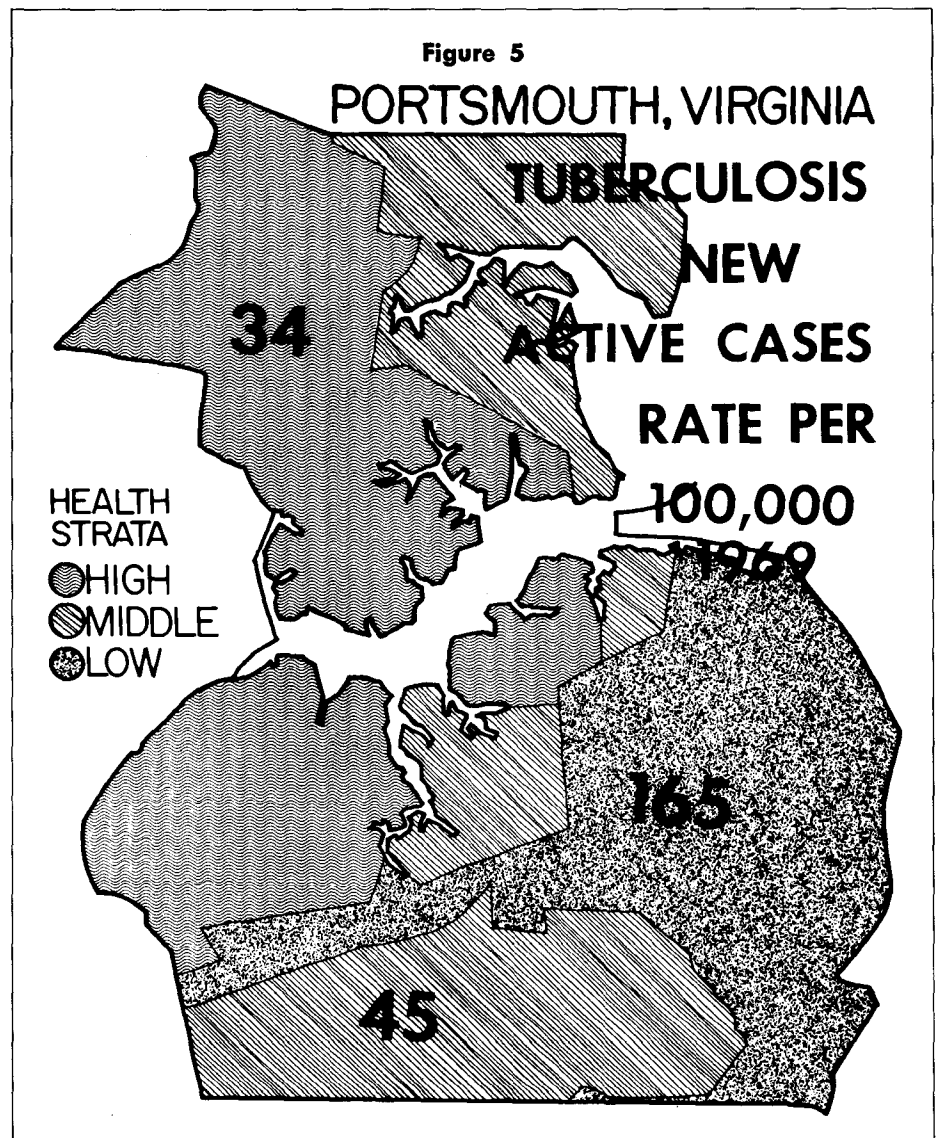
When considering illegitimate births, we again find a great excess, both black and white, in the low-income groups, thus illustrating the problem of economics rather

Figure 3



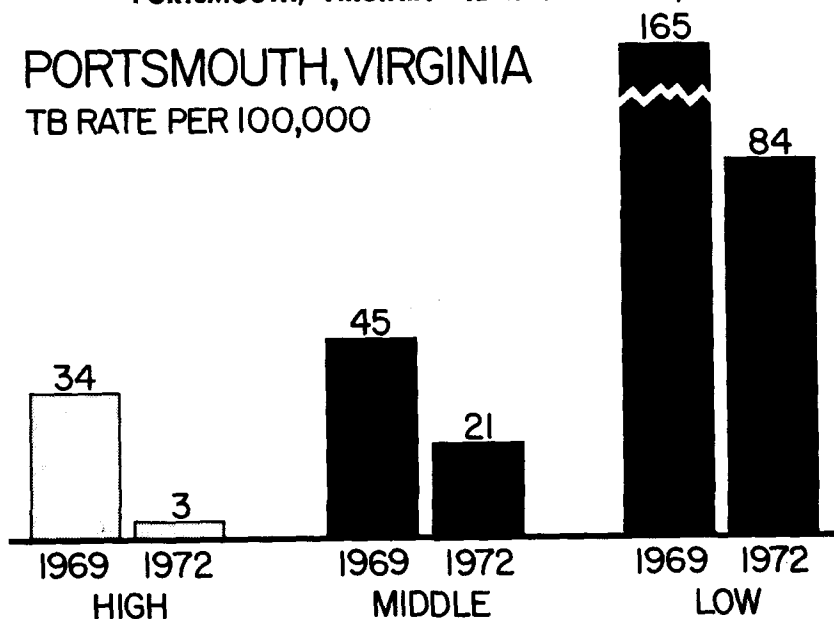
It is also our feeling that too much duplication of training and development exists. We feel that in disease control we should have infectious disease epidemiologists trained in the total area of infectious disease, not in the epidemiology of categorical diseases. We plan to have three or more disease control specialists working with tuberculosis, venereal disease, immunization, hepatitis, et cetera, as a group of diseases.

In summary: mapping of diseases by socio-economic stratification is one tool in the epidemiological armamentarium; it provides visual information that is equally useful for motivating both the professional and non-professional to take a closer look at the problems associated with ill health and to provide the tools to combat the problem.

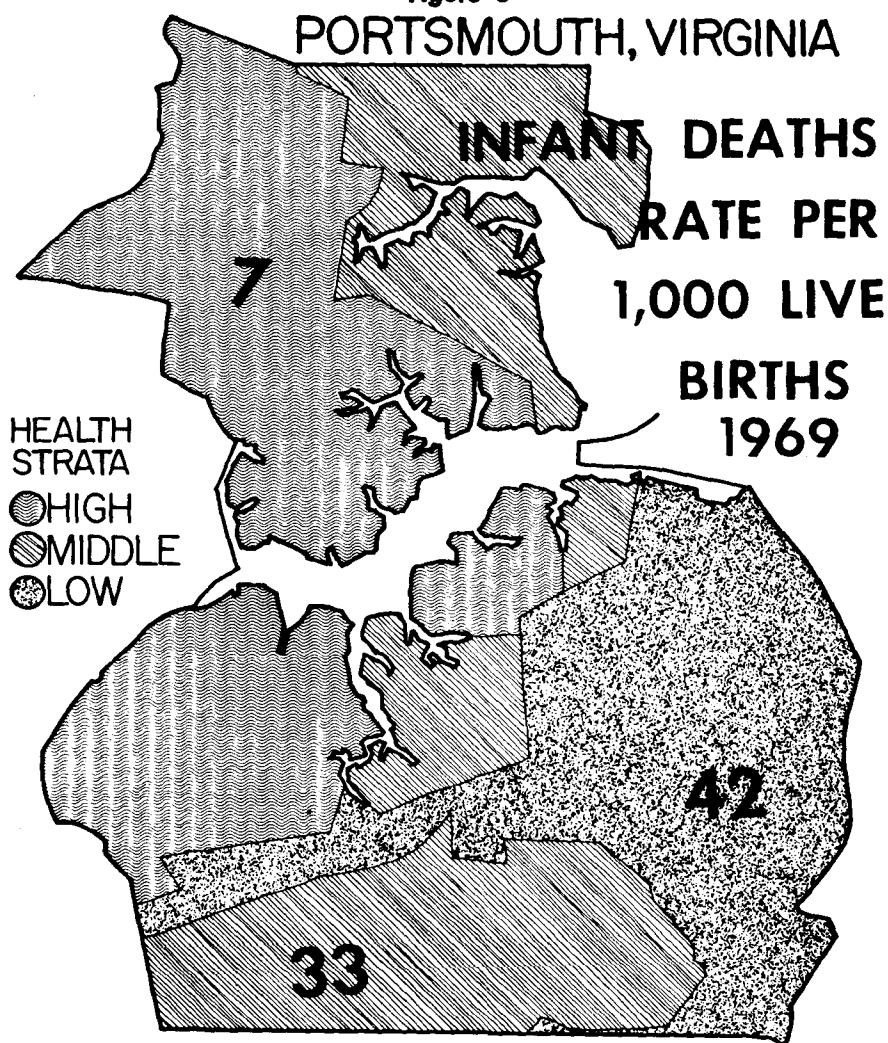


**Figure 7**  
**PORTSMOUTH, VIRGINIA — TB RATE PER 100,000**

**PORTSMOUTH, VIRGINIA**  
 TB RATE PER 100,000



**Figure 8**  
**PORTSMOUTH, VIRGINIA**



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Figure 5

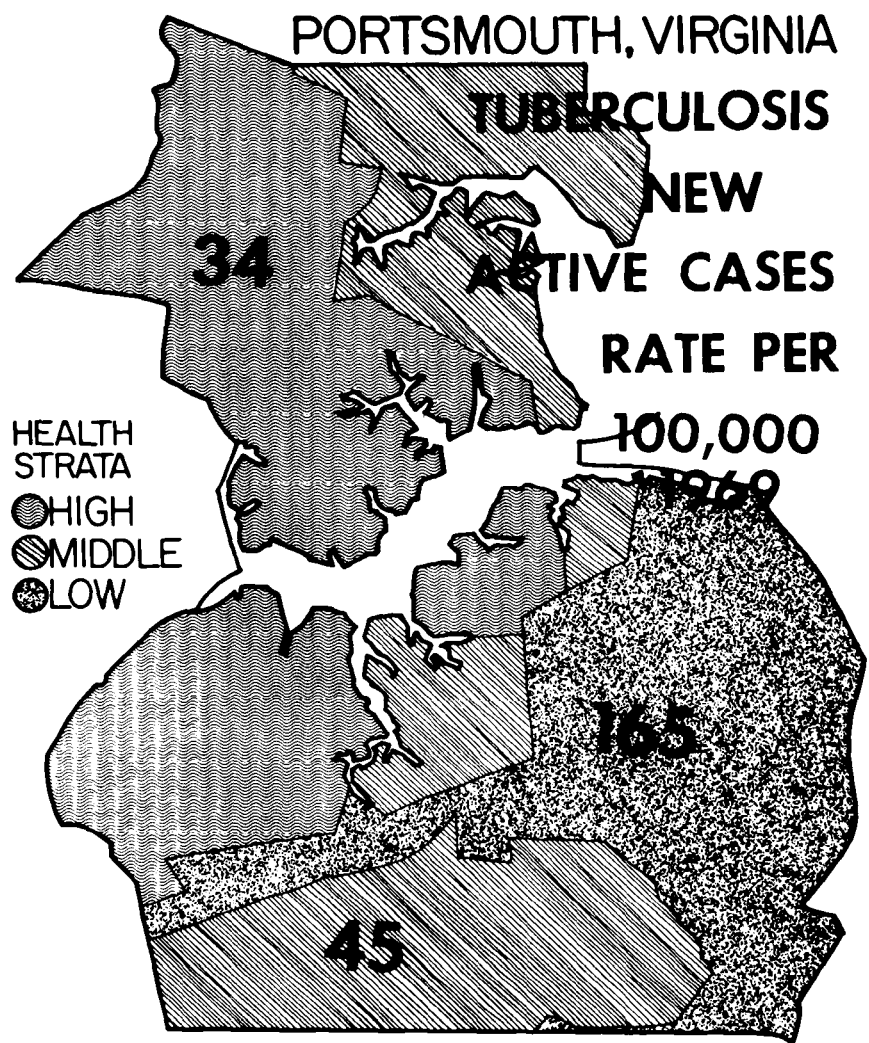


Figure 6  
ACTIVE TUBERCULOSIS CASES BY AGE GROUP

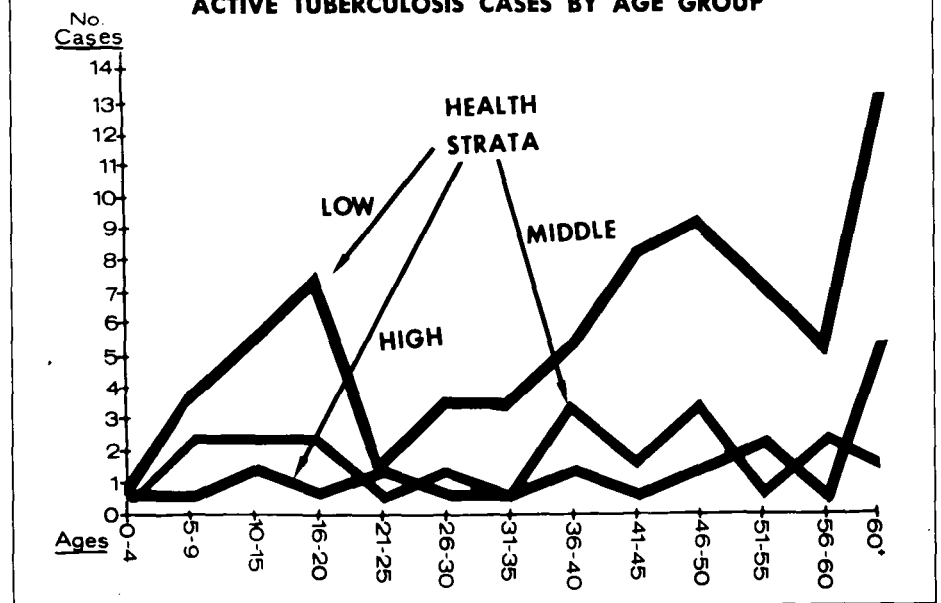
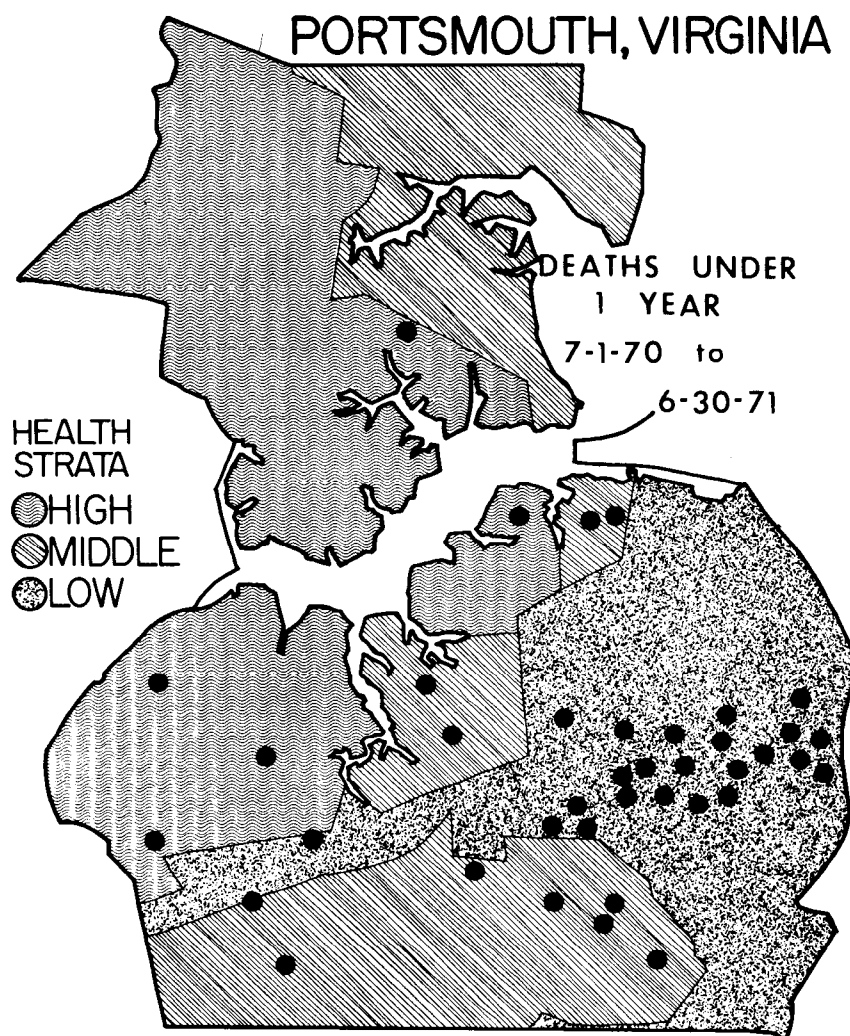


Figure 9



**Figure 10**  
**PORTSMOUTH, VIRGINIA — INFANT DEATH RATE, 1969**

