CERTAIN CHARACTERISTICS OF URBAN HOUSING AND THEIR RELATION TO ILLNESS AND ACCIDENTS: SUMMARY OF FINDINGS OF THE NATIONAL HEALTH SURVEY[1]

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ALTHOUGH more complete reports on the subject are in preparation,[2] it seems appropriate at this time to summarize the results of the National Health Survey bearing on the adequacy of urban housing and on the relation of housing to illness and accidents. The presentation will be in the form of simple illustrative charts[3] and such discussion of them as is necessary for clarity.

The National Health Survey was conducted from November, 1935 to March, 1936 for the purpose of obtaining information on serious illness, accidents, impairments, and medical care received, in relation to social and economic factors. Manifestly, one of the most important of these factors is housing, and, accordingly, certain information on housing was obtained and has been related to the illness record. The survey was made within the city limits (1930) of eighty-three cities in eighteen States (and in a limited number of rural areas), the cities being chosen to be reasonably representa-

[1] From the Environmental Sanitation Section of the Division of Public Health Methods, National Institute of Health, United States Public Health Service. The survey, a house-to-house canvass, was executed with the aid of grants from the Works Progress Administration. The scope, method, and general definitions of the study have been described previously: Perrott, George St. J.; Tibbitts, Clark; and Britten, Rollo H.: The National Health Survey: Scope and Method of a Nation-wide Canvass of Sickness in Relation to its Social and Economic Setting. *Public Health Reports,* September 15, 1939, 54, No. 37. Reprint No. 2098.

[2] One detailed report has already been issued: Adequacy of Urban Housing in the United States as Measured by Degree of Crowding and Type of Sanitary Facilities. National Health Survey, Preliminary Reports, Sickness and Medical Care Series. Bulletin No. 5, Division of Public Health Methods, National Institute of Health, United States Public Health Service, Washington, 1938.

[3] This series of charts was presented at a meeting of the Committee on the Hygiene of Housing of the American Public Health Association, held in New York City, November 6-8, 1939.

tive of geographic area and size-of-city groups. In large cities (100,000 population and over) the sample of households to be canvassed was determined by a random selection of many small districts based on those used in the United States decennial census of 1930. In the smaller cities selected for study, the population was enumerated completely. The data in this report have been limited to urban areas and to households[4] (except where otherwise noted) with at least one person related (by blood, marriage, or adoption) to the head of the household. There were 631,429 such households[5] canvassed.

I. Degree of Crowding

Although crowding may be evaluated in several ways, it was necessary in the National Health Survey to employ a simple measure, and that chosen was the number of persons per room.[6] As this index was calculated separately for each household, it was possible to determine the percentage of households falling into specified degree-of-crowding groups. Admittedly the measure is one of dwelling crowding *per se* and does not *directly* take into account use-overcrowding and congestion in halls and streets. If such aspects had been included, the percentage of households showing crowding would have been greater. Also it is to be observed that there are many dwelling units which, although not congested, are deficient from other hygienic points of view, such as lack of adequate ventilation, absence of sunlight, insufficient natural or artificial

[4] The household in the Health Survey was a group of persons (or one person) living in a dwelling unit such as a house, apartment, rooming house, dormitory, nurses' home, or room or suite in a hotel. The household included all persons who resided (slept) in the abode. "Family," as used in reports of the National Health Survey, refers to the group of members of the household related to the head; the term is avoided in this article since unrelated members are included throughout.

[5] The total number of urban households canvassed was 703,092. Thus, 71,663 (10 per cent) were excluded by confining attention to those with at least one person related to the head. Those excluded were mostly single-person households, dormitories, and rooming houses in charge of individuals with no person related to them living in the household.

[6] The number of persons per room is the ratio of the total number of persons in the household to the total number of rooms in the dwelling unit or abode in which the household resided. Bathrooms were excluded and kitchens included in this calculation.

illumination, dilapidation, fire hazards, absence of proper sanitary facilities, etc.[7] The measure of crowding used is subject to certain other limitations. For one thing, it is not possible to judge precisely the relative significance of the crowding index for households unlike in size—to judge whether, for instance, the occupying of two rooms by four persons is of the same significance to well-being as the occupying of four rooms by eight persons. Also, even for households of the same size there will be dissimilarities in average room size and in age composition.

Three groups have been distinguished on the basis of the crowding index: (1) households[8] with more than one person per room, (2) those with more than one-and-a-half persons per room, (3) those with two or more persons per room. The cumulative form is used to make summation by the reader unnecessary. It is important to emphasize the fact that these three groups are employed with no intention of fixing an exact line of demarcation between crowded and uncrowded households. It is precisely because the relation is one of degree that three levels of congestion have been adhered to.

The percentages of all households falling into the three degrees-of-crowding groups were respectively: 17.6; 6.3; and 4.0.[9]

Since crowded households tend to be large households—a point discussed on page 95—the proportion of *persons* living under a specified degree of crowding will be much greater than the proportion of *households* showing that degree of crowding. In Figure

[7] A recent publication relating to housing needs from the point of view of health is: BASIC PRINCIPLES OF HEALTHFUL HOUSING. Committee on the Hygiene of Housing, American Public Health Association, May, 1939 (second edition).

[8] Throughout the report (except where otherwise noted) the word *household* will be used to mean a household with at least one person related to the head. Households with eight or more members in which the number of persons exceeded the number of rooms by *one* are not included in any of these three groups, but only in the total (i.e., as one person or less per room).

[9] The corresponding percentages for all households (including those with no person related to the head) were: 16.1; 5.9; and 3.8. *See* paper cited in footnote 2. As stated (*see* footnote 5), most of the households with no person related to the head were single-person households. Clearly, a person living alone will have at least one room to himself; hence, the lower values.

1 these two sets of percentages are compared. The difference is patent. Whereas there were 17.6 per cent of *households* with more than one person per room, 25.9 per cent of *persons* were living in households with more than one person per room; a similar relation is shown for the more severe degrees of crowding.

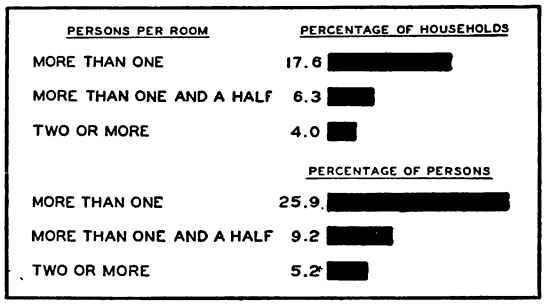


Fig. 1. Percentage of households with different degrees of crowding and percentage of persons therein. (Data for persons based on 0.5 per cent random sample of punched cards.)

In the bulletin previously referred to (*see* footnote 2) stress was placed on the wide variation in the character of the housing problem in different parts of the country, in cities of different sizes, in individual cities in the same geographic-area-and-size-of-city group, and in various groups of the population in any one city. It was stated that no generalizations based on averages for the whole area would suffice to describe the housing situation, and it was pointed out that in one city 40 per cent of the households had more than one person per room, while in another city less than 3 per cent showed this degree of crowding. Although in the present article data will not be presented for individual cities, the variable nature of the housing problem will still be manifest.

Contrary to popular impression, crowding is a problem of the small city as well as of the large. This fact is apparent from Table 1 giving the percentage of households with more than one-and-a-half persons per room.[10]

The above data also suggest differences by geographic area. These are shown graphically in Figure 2 (for white and colored households separately). The South shows the highest percentages for

[10] *See also* table 2 in bulletin cited in footnote 2.

Size of City (1930)	Area			
	Northeast[1] Per Cent	North Central Per Cent	West Per Cent	South Per Cent
500,000 and Over	4.6	5.8	4.2	—
100,000 to 500,000	4.4	5.8	3.4	12.1
25,000 to 100,000	2.3	5.4	4.1	13.9
Under 25,000	2.7	6.4	4.3	15.6

[1] The Health Survey States included in the four regions are: Northeast—Massachusetts, New Jersey, New York, Pennsylvania; North Central—Illinois, Michigan, Minnesota, Missouri, Ohio; West—California, Oregon, Utah, Washington; South—Alabama, Georgia, Louisiana, Texas, Virginia.

Table 1. Percentage of urban households in the Health Survey with more than one-and-a-half persons per room, by area and size of city.

both white and colored. For white, the lowest percentages are found in the West; for colored, in the Northeast.[11]

A marked contrast in the amount of crowding among white and colored households is indicated by the figure—the colored population is manifestly one of the focal points of the housing problem.

Under housing conditions existing at the present time, the size of the household is another primary factor in the amount of crowding. In the Health Survey, the proportion of households with more than one-and-a-half persons per room varied from 3 per cent for two-person households to nearly 50 per cent for eight-or-more person households. The curves by size of the household are given in Figure 3.[12] As suggested above, no data are available to

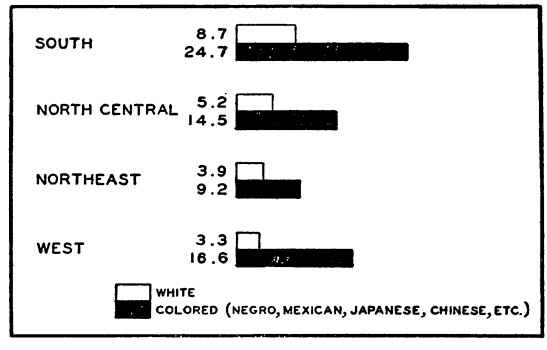


Fig. 2. Percentage of households with more than one-and-a-half persons per room by geographic region and color.

[11] Although "colored" in most sections of the country is essentially Negro, the percentage for colored in the West is largely determined by non-Negro groups. Mexican has been included with colored for the purpose of this report.

[12] Irregularities in the two lower curves shown in the figure are due to the nature of

(Continued on page 96)

determine at all precisely the relative significance of this index of crowding for families of different sizes.

That there is a high degree of association between crowding and economic status is generally recognized. The point received primary consideration in the bulletin cited above (*see* footnote 2), where the amount of crowding in each city surveyed was shown against annual family income and relief status. In this summary, it has seemed preferable to relate crowding directly to the amount of rent charged.[13] In later reports these comparisons will be made in more detail; but here, as a matter of simplification, and in view of the wide divergences in crowding in households of different sizes, a special group has been chosen—namely, five-person white households living in rented "multiple"[14] dwellings. For this special group, as shown in Figure 4, the percentage with more than one-and-a-half persons per room fell from 72.6 for households with rentals below $10 a month to 6.8 for house-

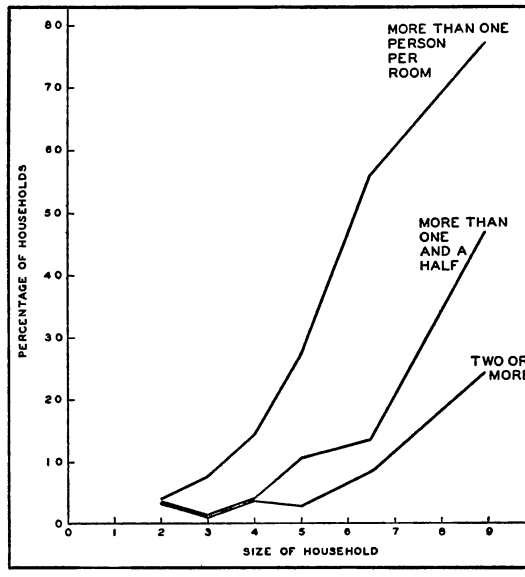


Fig. 3. Percentage of households with different degrees of crowding by size of household.

the index which is based on discrete values (the number of persons and the number of rooms in each dwelling unit). *See also* footnote 8.

For reasons of tabulation, persons unrelated to the head were disregarded in classifying households by size (in computing persons per room all persons in the household were counted; *see* footnote 6).

[13] For households renting their living quarters at the time of the visit a record was made of the monthly rental being charged (not necessarily paid) for such quarters at that time; for households owning their living quarters at such time, the record made was that of the family informant's estimate of the value of such quarters.

[14] A "multiple" dwelling in the Health Survey was one in which the individual dwelling units did not have separate entrances from the street.

holds with rentals of $30 a month or more. Similar relations existed for rented "single" dwellings, for households of other sizes, and for households living in owner-occupied dwellings (against value rather than against rental).

One additional point relative to crowding which deserves mention, even in a brief summary, is its variation with age. Since larger households, which tend to be more crowded, also tend to have younger persons in them, it is but natural that wide differences would be found in the proportion of persons of particular ages in the three degree-of-crowding groups. In Figure 5 these relations are illustrated separately for the white and the colored populations. The percentage in each of the three degree-of-crowding groups decreases

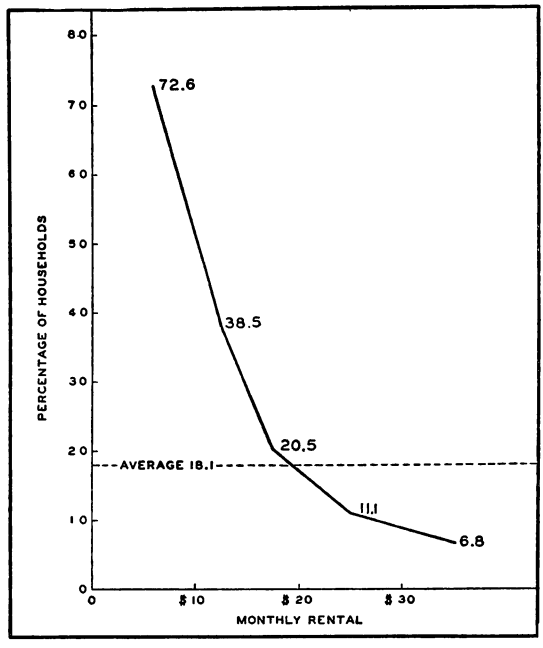


Fig. 4. Percentage of households with more than one-and-a-half persons per room by monthly rental. (Five-person white households in rented multiple dwellings.)

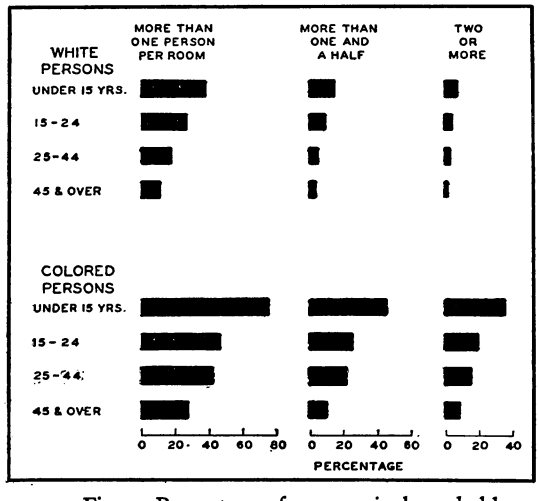


Fig. 5. Percentage of persons in households with different degrees of crowding by age and color. (Based on 0.5 per cent random sample of punched cards.)

markedly as age increases. Crowding is evidently much greater among children[15] than among adults.

To summarize the data on crowding, it may be stated: (1) that the problem of crowding (as measured by the index "persons per room") is present in the small as well as in the large city, (2) that it varies with geographic area, (3) that it is much greater for the colored population, (4) that it increases with size of the household, (5) that it is greatest at low rental levels, and (6) that the percentage of persons living under crowded conditions decreases as age increases.

II. Toilet Facilities

With the widespread use of the water-carriage system of sewerage, a flush-type toilet inside the dwelling unit and not shared with other households would seem to be—at least in urban areas—one essential of good housing.[16] In the Health Survey, 11.4 per cent of urban households did not meet this standard.[17] The type of toilet facilities available to this group, with the percentage of all households using each type of facility, is shown in Table 2.

There was a greater relative frequency of substandard toilet facilities in smaller cities. The quantitative relations were shown in tables

Table 2. Percentage of households in the Health Survey having specified type of toilet facilities.

Type of Toilet	Percentage of Households
Not Shared With Other Households	
Flush, Outside	2.9
Privy	4.1
Shared With Other Households	
Flush	
Inside	3.1
Outside	0.9
Privy	0.5
Total Without "Private Inside Flush Toilets"	11.4

[15] It should be recalled (footnote 6) that the degree-of-crowding index is based on the total number of persons in each household (regardless of age).

[16] *See* article cited in footnote 7.

[17] This percentage is less than that given for all households in the article cited in footnote 2, for which the figure was 13.0 per cent. The exclusion of households without at least one person related to the head affects particularly the percentage with inside flush toilets shared with other households.

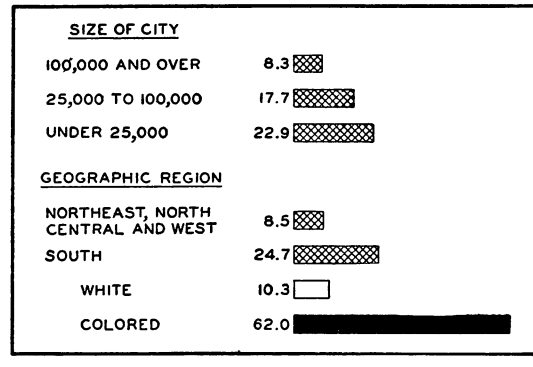
3-6 of the previously cited bulletin (*see* footnote 2); here a few illustrations must suffice. For households with two or more related persons, the percentages which either lacked inside flush toilets, or shared them with other households by size of city are shown in Table 3. These percentages are shown graphically in Figure 6, which also gives corresponding percentages for the South in comparison with other parts of the country, and separately for the white and the colored households in the South. Even for white households alone, the percentage was greater in the South than in other parts of the country. It was six times as great for the colored as for the white households in the South.

Table 3. Percentage of urban households in the Health Survey lacking private inside flush toilets, by size of city.

Size of City	Percentage of Households
100,000 and Over	8.3
25,000 to 100,000	17.7
Under 25,000	22.9

Averages given in this figure fail to depict the wide variation from city to city in the percentage of households not meeting the above standard (i.e., without private inside flush toilets). Such variations are so great as to make a consideration of the data for individual cities almost a necessity. Hence, reference is again made to the previous article (*see* footnote 2), in which the percentages were so shown. The number of cities with specified percentage of households without private inside flush toilets,[18] for different city sizes are shown in Table 4.

Fig. 6. Percentage of households *without* private inside flush toilets by size of city, geographic region, and color.



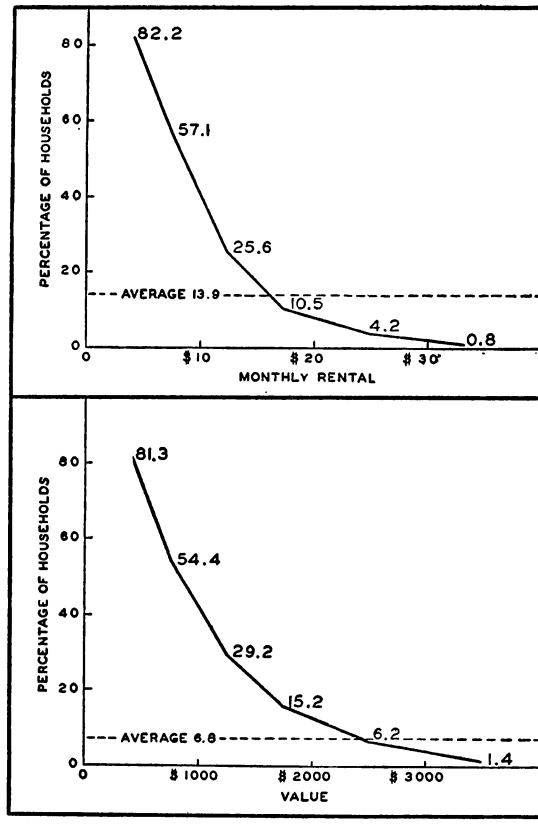
[18] All households are used for this comparison, rather than those with at least one person related to the head.

Size of City	Number of Cities			
	Under 10 Per Cent	10-19 Per Cent	20-29 Per Cent	30 Per Cent and More
100,000 and Over	18	7	5	1
25,000 to 100,000	4	2	2	2
Under 25,000	12	7	6	17

Table 4. Number of cities in the Health Survey classified by size and percentage of households lacking private inside flush toilets.

The wide range exhibited in this table is closely associated with variations in the average income level of different cities and with the proportion of households which were colored. Furthermore, although in the high income groups practically all households, wherever the city and whatever its size, had inside flush toilets which were not shared with other households, in the case of any particular low-income group there was a wide variation from city to city in the percentage not meeting the standard.

Fig. 7. Percentage of households *without* private inside flush toilets by rental or value.



In Figure 7 is brought out the close relation between rental (or value, for owner-occupied dwellings) and the percentage which lacked inside flush toilets or shared them with other

households. At monthly rentals of over $30, the percentage is nominal; on the other hand, at low rentals it is very great. It may be stated that similar relations hold for large cities as well as for small[19] and in each geographic area.

A slightly different point of view may be taken. It may be asked, what rental (or value) is required to furnish various population groups with facilities of the type under consideration? Accordingly, in Figure 8, the proportion is expressed as the percentage of households *with* inside flush toilets that were not shared with other households. For the purpose of this summary, the white and colored in the South have been contrasted with the rest of the country, the comparison being limited to certain low-rental (or value) groups in cities of from 25,000 to 100,000 population. (It is to be noted that direct comparison with the lower part of Figure 6 therefore cannot be made.)

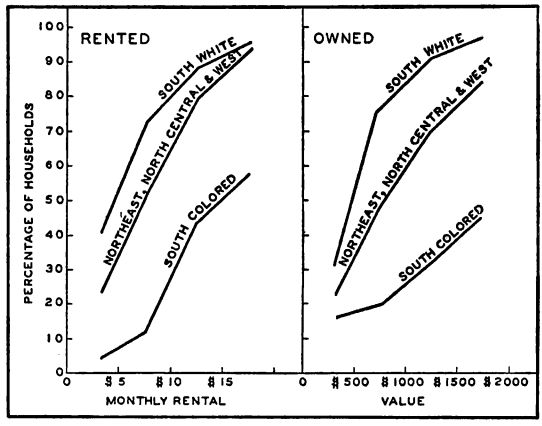


Fig. 8. Percentage of households with private inside flush toilets by geographic region, color, and rental or value (cities of 25,000 to 100,000).

Figure 8 shows, to choose an example, that with rentals of from $10 to $15 a month, about 90 per cent of white families in the South in the specified size group met the standard set, whereas 80 per cent of families in the rest of the country met it. However, the figure indicates that of the colored households in the South with this rental, only 45 per cent had inside flush toilets which were not shared with other households.

[19] In large cities the deficiency tends to consist in the communal use of inside flush toilets; in small cities, in the absence of such facilities.

To summarize the data on toilet facilities—in terms of the percentage of households which either did not have inside flush toilets or shared them with other households—it may be stated: (1) that the smaller cities showed much larger percentages, (2) that the South fared worse than the rest of the country, (3) that colored households in the South showed the highest percentages, (4) that there were wide variations from city to city apart from the question of geographic area or size, and (5) that there was a close relation with rental (or value).

III. Illness and Crowding

The existence of excessive rates of sickness and mortality in the slums or overcrowded districts of cities is an accepted fact, but the extent to which poor housing *per se* is responsible for these differences is very difficult to ascertain because of the interaction of many economic and sociological factors.[20] An intensive analysis of the data of the Health Survey bearing on this question has been undertaken; but, pending the completion of such studies, it seems opportune in this summary to give the illness rates obtained in households characterized by various degrees of crowding, even though at this time it is not possible to unravel all the causative factors. Comparisons will also be made for households at different economic levels.

In this section (Illness and Crowding) the persons-per-room index takes on a different significance than when used to measure the extent of crowding. Because of the close association between congestion and other aspects of deficient housing, the index is one of

[20] *See:* Britten, Rollo H.: The Relation Between Housing and Health. *Public Health Reports,* November 2, 1934, 49, No. 44. Reprint 1656.

DallaValle, J. M.: Some Factors Which Affect the Relationship Between Housing and Health. *Public Health Reports,* July 23, 1937, 52, No. 30. Reprint 1840.

Winslow, C.-E. A.: Housing as a Public Health Problem. *American Journal of Public Health,* January, 1937, 27, No. 1.

Britten, Rollo H.: Housing and Health. *American Journal of Public Health,* August, 1938, 28, No. 8.

Leukhardt, John C.: The Influence of Housing on Health. *The Interne,* October, 1939, v, No. 10.

general housing quality. This fact has weaknesses and virtues. Although it will not be possible to separate the factor of crowding *per se* from the other aspects of poor housing, it will be possible to use a simple index to stand for more than the index seems to mean at first glance. The results are not to be interpreted as expressing merely the relation between crowding and illness. However, it must also be realized that the index is a crude measure of economic status, and that families sometimes live in crowded conditions because disease has reduced their income to the point where they cannot pay rent for adequate quarters.

It has been found convenient to establish three groups of households by degree of crowding and to assign the letters *A, B,* and *C* to such groups. The table below defines the groups and shows the percentage of persons in each. These figures (as well as the data on illness in this section) relate to the white population only[21] and to households which included both the household head and his wife.[22]

	Per Cent
A. One Person or *Less* Per Room	74.9
B. More Than One Person Per Room, But *Not More* Than One-and-a-Half	16.7
C. More Than One-and-a-Half Persons Per Room	8.3

With respect to the type of illness rates employed, it should be stated that in the National Health Survey information was obtained for a twelve-month period immediately preceding the visit. Since it was realized that minor illnesses, especially of a non-

[21] Differences in the incidence of disease among white and colored persons and questions of the relative efficiency of reporting among white and colored persons have made it desirable, for the purpose of this brief summary, to exclude discussion of illness rates for colored persons.

[22] It was necessary, for reasons of tabulation, to confine attention in this section to households which included both the household head and his wife. The population in such households was 1,841,000. With the further exclusion of persons concerning whom certain information was not known (family income, education of wife of the head, persons per room, or age) the population base becomes 1,769,993.

disabling type, would tend to be forgotten, analysis[23] was limited to illnesses which had caused disability for seven consecutive days or longer during this twelve-month period.[24] Disability was defined to mean inability to work, attend school, care for home, or carry on other usual pursuits by reason of disease, accident, or physical or mental impairment.[25]

The rate to be discussed first is the percentage of persons having an illness disabling for a week or more during the twelve months immediately preceding the visit.[26] Because of differences in the age composition of households in the three groups (relatively more children and fewer middle-aged and old persons in the more crowded households), it has been found desirable to determine what such rates would be if a standard age composition were assumed.[27] Adjustment of this character permits consideration of the relation between illness and housing, with the effect of one influencing factor (age) approximately removed.

The unadjusted and adjusted rates (i.e., the percentages of persons with an illness disabling for a week or longer), for the three degree-of-crowding groups are shown in Table 5. The ratio of the adjusted rate for group *C* to that for group *A* is 1.20.[28]

[23] Certain other information (e.g., illnesses from which a person was disabled on the day of the visit, chronic diseases whether disabling or not) was also obtained, but will not be discussed since not presented in this report.

[24] Including confinements, hospital cases, and fatal cases, without limitation as to the duration of disability.

[25] *See* article cited in footnote to title of this paper for specific illness definitions employed in the Health Survey. A summary of the illness data has also been published: Britten, Rollo H.; Collins, Selwyn D.; and Fitzgerald, James S.: The National Health Survey: Some General Findings as to Disease, Accidents, and Impairments in Urban Areas. *Public Health Reports,* March 15, 1940, 55, No. 11.

[26] This rate is less than that of the frequency of illnesses disabling for a week or longer, since in the former case not more than one illness for any person enters into the rate. (There were 1.14 illnesses per person with an illness of the type specified.)

[27] The customary method was used, adjusting each crowding group to the age distribution of all such groups combined; that is, within any specified group (*A, B, C*) the rate for each of four age groups was multiplied by the total number of persons in that age group (*A, B,* and *C,* combined), the products were summed, and the sum was divided by the total number of persons.

[28] For two or more persons per room the percentage was 18.9 (adjusted to the standard age composition)—the ratio of this percentage to that for group *A* being 1.28.

Degree of Crowding	Per Cent	
	Unadjusted for Age	Adjusted for Age
A One Person or Less Per Room	14.6	14.8
B More Than One Person Per Room, But Not More Than One-and-a-Half	15.8	15.7
C More Than One-and-a-Half Persons Per Room	17.2	17.8

Table 5. Percentage of urban white persons in the Health Survey having illness disabling one week or longer, according to degree of crowding.

As suggested in the beginning of this discussion, this excess is, in part at least, associated with differences in economic status. Figure 9 indicates, however, that some excess was present in the relief group, taken by itself, and in the nonrelief group with annual family incomes under $1,000. The ratio of the rate for degree-of-crowding group *C* to that for group *A* in these two instances was 1.09 and 1.12, respectively. Although these differences are not very great, the large population involved makes them significant.

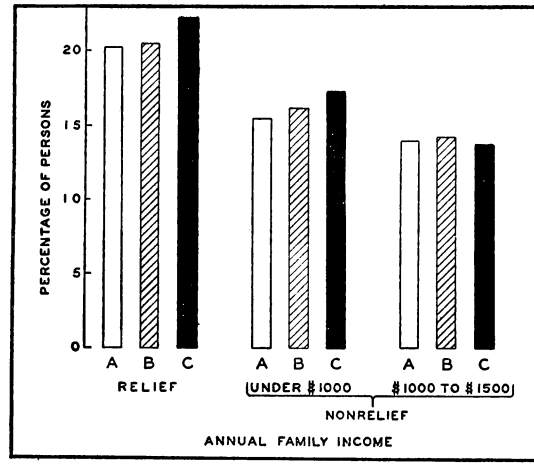


Fig. 9. Percentage of white persons with an illness disabling for a week or longer during one year by degree of crowding and income. (Adjusted to standard age composition.)

In Figure 9 the effect of age was eliminated in the manner described; but it is also of interest to show the extent of the excess of the illness rate among persons of different ages. This comparison is made in Figure 10 for a few broad age groups, representing children, youths, productive and middle

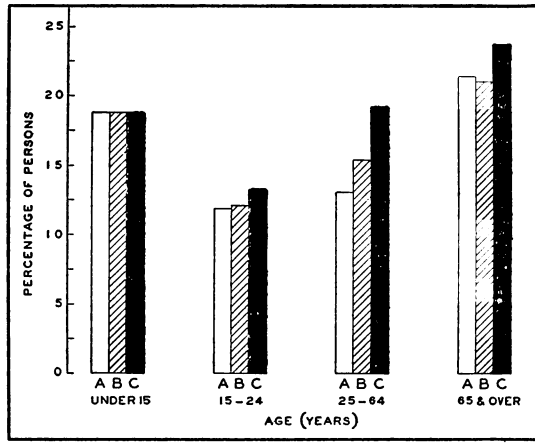


Fig. 10. Percentage of white persons with an illness disabling for a week or longer during one year by degree of crowding and age. (Age group under 15 adjusted to standard size of household.)

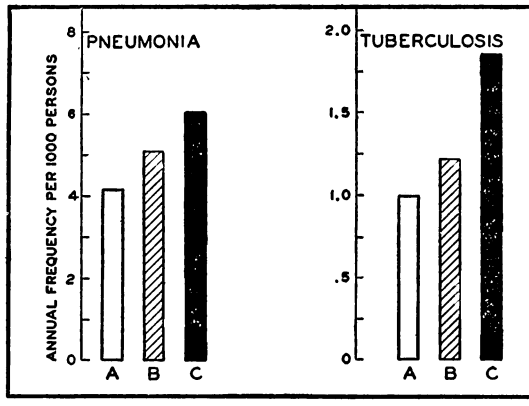


Fig. 11. Annual frequency of pneumonia and tuberculosis (illnesses disabling for a week or longer) in different crowding groups, among white persons. (Adjusted to standard age composition.)

ages, and old age. An excess is found in each of these groups (except that of children[29]); it is greatest in the productive period of life.

With these relations in mind, one's interest turns to specific diagnoses, especially those which might be expected to reflect more sensitively the effect of poor housing. Further study is being made of the relation by diagnosis, but it is possible to present the comparison for a few diseases[30] now. In Figure 11 is shown the annual frequency of pneumonia and of tuberculosis.[31] As in the case of Figure 9, adjustment has been made to a standard age composition. There is noted a marked increase in the

[29] A slight decrease was present in the basic rates, which was due to differences in family size. Adjustment was therefore made to a standard size of family.

[30] Illnesses disabling for a week or longer during the twelve months immediately preceding the visit, including fatal illnesses and hospital cases of any duration of disability. Sole and primary diagnoses.

[31] Persons in institutions for the care of physical or mental diseases were not directly

(Continued on page 107)

rate for each of these diseases as the degree of crowding increases. It may be stated that for pneumonia there were also sharp increases in the rates with increased crowding within the relief group and within the next higher income group (nonrelief, under $1,000).

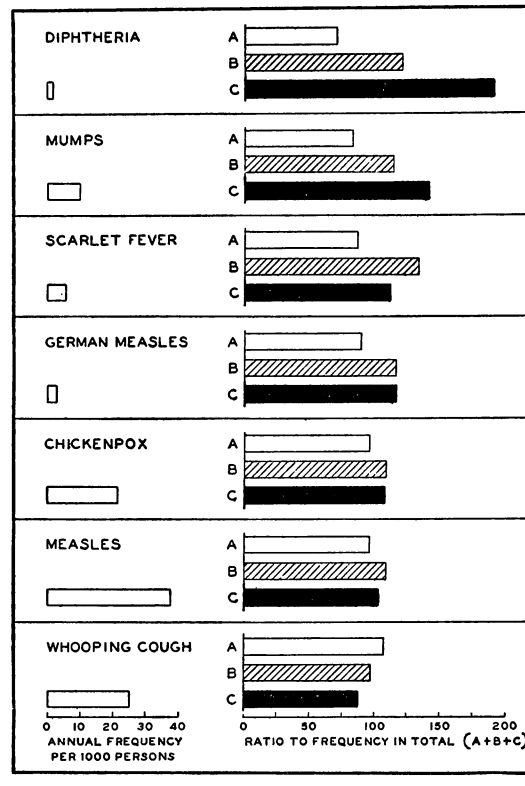


Fig. 12. Frequency of common communicable diseases of childhood and ratio of frequency in specific degree-of-crowding groups to that in total. (White children under 5 years of age.)

Figures 12 and 13 present data for the common communicable diseases of childhood. The former gives for each of these diseases (a) the rates per 1,000 children under 5 years of age—that is, during infancy and preschool ages—and (b) the ratio in any specific degree-of-crowding group (*A, B, C*) to the total rate. Several diseases show relatively higher rates in the more crowded groups (especially diphtheria and mumps); but a point of particular interest is brought out in Figure 13, giving for each of these diseases and for each degree-of-crowding group, the ratio of the rate for children under 5 years of age to that for children aged 5 to 9 years. Without exception, these ratios increase from group *A* to group *C*,

enumerated in the Health Survey, but the family was asked to report with regard to any such persons who had formerly lived in the household. The record obtained was incomplete; hence, the cases of tuberculosis on which the rates in Figure 11 are based are largely those still in the home.

indicating a younger age incidence of these diseases under the conditions associated with poor housing. It is generally recognized that a younger age incidence means a greater risk of serious complications and of mortality. As in the other comparisons, it is not possible to determine exactly what factors in the poor housing environment are responsible for differences found, but in this instance the suggestion is made that the number of children in the household may be an important, perhaps the primary, factor in the association. It has already been shown (Figure 5) that crowding is more pronounced among children.

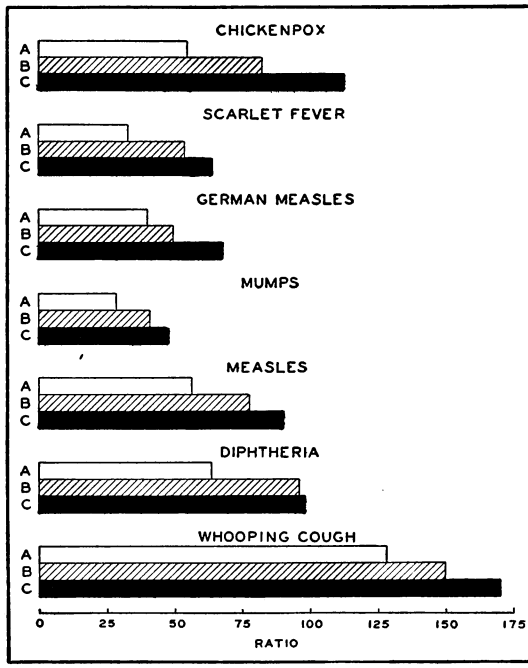


Fig. 13. Ratio of (1) frequency of common communicable diseases of childhood in age group under 5 to (2) that in age group 5-9 for each degree-of-crowding group.

To summarize the data on illness and crowding, it may be stated: (1) that the frequency of illnesses disabling for a week or longer is greater in crowded households, (2) that this is true, in less degree, for the relief group and for the nonrelief group with annual family incomes under $1,000, (3) that there is a marked increase in the incidence of pneumonia and tuberculosis with increase in crowding, and (4) that the common communicable diseases of childhood show an earlier age incidence in crowded households.

IV. Digestive Diseases and Toilet Facilities

In Figure 14 is illustrated another approach to the problem of re-

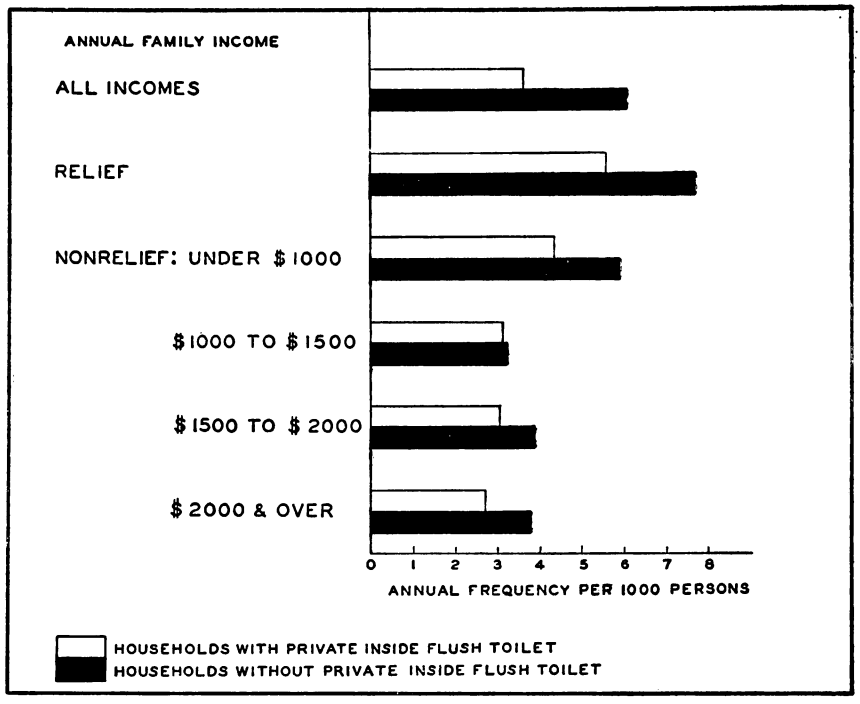


Fig. 14. Frequency among white persons of certain digestive diseases disabling for a week or longer during one year in relation to presence of sanitary facilities, by annual family income. (Indigestion and other stomach ailments; diarrhea, enteritis, colitis; typhoid and paratyphoid fevers.)

lating illness and housing. A group of digestive diseases,[32] the incidence of which might be thought to be associated with the presence or absence of various types of toilet facilities, have been selected and their frequency correlated with the index used in the section dealing with these facilities. In other words, the rate per 1,000 persons living in households[33] with private inside flush toilets has been compared with that for persons in households not meeting this standard. The illnesses are limited to those causing disability for a week or more[34] during the twelve months immediately preceding

[32] Indigestion and other stomach ailments; diarrhea, enteritis, colitis; typhoid and paratyphoid fever. Sole, primary, and contributory diagnoses.

[33] White households in which there was at least one person related to the head, known income (population 2,076,641).

[34] Including fatal illnesses and hospital cases of any duration of disability.

Area and Toilet Facilities	Rate of Digestive Diseases		
	Cities 100,000 and Over	Cities 25,000 to 100,000	Cities Under 25,000
Northeast, North Central, and West			
With Private Inside Flush Toilet	3.3	3.9	4.1
Without Private Inside Flush Toilet	4.8	7.3	6.8
South			
With Private Inside Flush Toilet	4.0	5.0	5.3
Without Private Inside Flush Toilet	5.1	8.0	8.2

Table 6. Frequency of digestive diseases (disabling one week or longer) per 1,000 urban white persons in Health Survey households with and without private inside flush toilets, by geographic area and size of city.

the visit. The rates in the two groups were 3.6 and 6.1 respectively—an excess of 70 per cent in the group without private inside flush toilets. In the interpretation of this excess, several points must be borne in mind. First, in households not meeting this standard there will probably be concomitant deficiencies (especially, lack of screening and poor facilities for refrigeration of food) which may have an effect on the illness rate from this group of digestive diseases. As in the case of the crowding index employed in the preceding section, we are confronted with an expression which tends to measure poor housing as a whole. In the second place, the excess may be due, in part at least, to the lower economic level of households which do not meet the standard set as to toilet facilities. However, the chart (Figure 14) shows that the excess is marked in each income group. Because an earlier comparison showed a marked change in the percentage having private inside flush toilets with size of city and geographic area, a third point is whether such differences can account for the relation shown. That they do not is shown by Table 6, giving the frequency per 1,000 persons of these digestive diseases (defined as in Figure 14) by geographic area and size of city, for white persons in households with and without private inside flush toilets.

To summarize the data on digestive diseases and toilet facilities, it may be said: that the rate for persons in households without inside flush toilets, not shared by other households, showed a marked excess over the rate for persons in households having such facilities.

v. Home Accidents and Rental (or Value)

Accidents in the home are frequently the result of specific hazards associated with dilapidation and other factors involved in poor housing. Hence, it is of interest to consider the correlations found in the Health Survey, in which a record was obtained for serious accidents (disabling for a week or more during the twelve months immediately preceding the visit). Accidents were classified by the enumerator as home, public, or occupational, and whether due to an automobile or not.[35] For the present purpose home accidents only will be considered, for which the rate was 4.6 per 1,000 persons.[36]

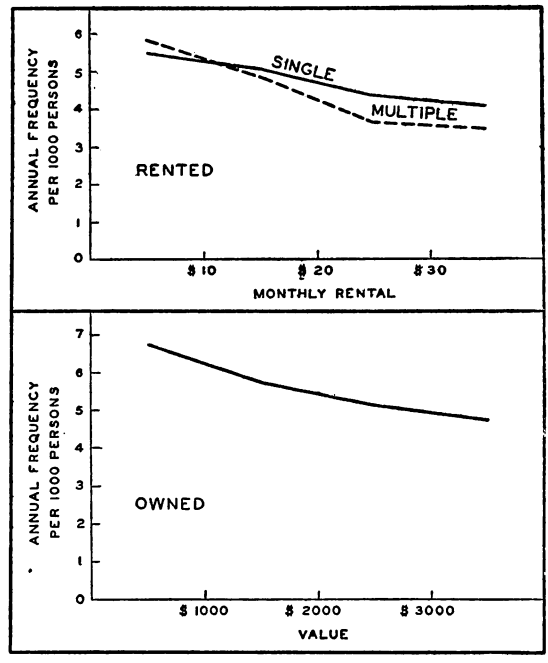


Fig. 15. Frequency of accidents in the home disabling for a week or longer, by rental or value.

[35] *See:* The National Health Survey, 1935-36, Accidents as a Cause of Disability. Preliminary Reports, The National Health Survey, Sickness and Medical Care Series, Bulletin No. 3. Division of Public Health Methods, National Institute of Health, United States Public Health Service, Washington, 1938.

[36] Cases disabling for a week or longer, including fatal cases and hospital cases of any duration of disability. Sole, primary, and contributory diagnoses.

The entire surveyed population is used in the comparisons in this section, except for the exclusion of unknown rental (or value) and unknown age (population 2,415,000).

No information bearing directly on the condition of the houses surveyed was obtained; hence, it is again necessary to establish an index for purposes of comparison. In this instance, the most logical basis seemed to be the rent charged for the dwelling unit (or the value, if owner-occupied). (*See* footnote 13.) Since earlier comparisons (Figure 4) have shown that the lower the rental, the more crowded the dwelling unit, it is clear that the index must be regarded as measuring more than appears on the surface. That is, while rent (or value) fails to be an adequate measure of accident hazards in the home, it tends to measure, as do the crowding and toilet facility indexes, the whole poor housing environment. From one point of view, however, we are on surer ground than in the illness rate comparisons, since as a general rule current accidents

Means of Injury[1]	Rate per 1,000 Persons
Falls	2.97
Burns	0.38
Cutting and Piercing Instruments	0.58
Miscellaneous	0.67

[1] *Falls* relates to falls of persons and includes fractures and sprains unspecified as to means of injury. *Burns* comprises burns of any type (except those from electric currents). *Cutting and piercing instruments* includes infected wounds unspecified as to means of injury. The *miscellaneous* group is made up largely of accidents caused by machinery, animals, firearms, etc., and of poisonings (gas, food, plants, etc.). Homicides and suicides (including attempts) are excluded.

Table 7. Frequency of home accidents (disabling one week or longer) per 1,000 persons in the Health Survey group, by means of injury.

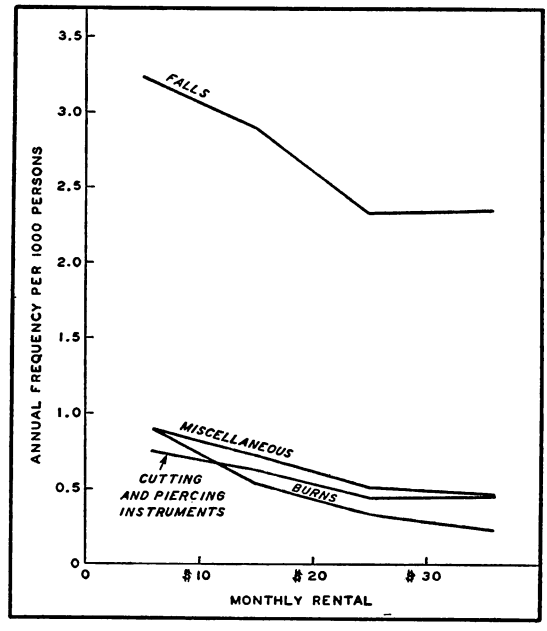


Fig. 16. Frequency of home accidents disabling for a week or longer, by means of injury and rental. (Households in rented multiple dwellings.)

will not of themselves have driven the family into homes for which lower rents are charged. These are points to be kept in mind in evaluating the comparisons.

In Figure 15 are plotted curves for the frequency of home accidents disabling for a week or longer. For rented dwellings a separation is made as to single and multiple. (*See* footnote 14). All three curves show an inverse correlation with rental (or value).[37]

Home accidents were classified in the Health Survey by means of injury, as shown in Table 7. A future report will present these data in more complete form; here it must suffice to give one additional chart, by way of example. Figure 16 indicates that, for rented multiple dwellings, the rates for accidents due to each of these means of injury decrease with increasing rental. Burns show the greatest relative decrease.

To summarize the data on home accidents, it may be said: (1) that the frequency of home accidents decreased as the rental (or value) went up, and (2) that this tendency was true of accidents due to various means of injury (such as falls, burns, etc.).

Summary

In this report have been given the general results of the National Health Survey bearing on (I) degree of crowding, (II) toilet facilities, (III) illness and crowding, (IV) digestive diseases and toilet facilities, and (V) home accidents and rental (or value). The findings have been summarized at the end of each section.

[37] The reason for the higher rate for owned than for rented is not clear. The excess is confined to falls (3.4 for owned, 2.8 for rented single, 2.6 for rented multiple).