

How Does the Quality of Housing Affect Health and Family Adjustment?

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The question posed by the title of this paper is not completely answered in it. However, the interpretive reader may see in this preliminary report some practical suggestions that will help him lay a solid ground work for an investigation of similar problems that may confront him.

✻ March, 1954, was the effective starting date of a five-year study on some of the effects of housing quality on health and family life. The actual collection of data began April, 1955, but because of the long-range nature of the study findings that are relevant to the hypotheses will not be available for a number of months. This paper is concerned with the background of the project and with a description of the study methods being employed. As we discuss its different phases, we will have occasion to mention problems incurred in carrying out a controlled study design in which the independent variable is an aspect of the human social environment. These problems rarely get a public airing at a time when they are uppermost in the minds of investigators. When final reports are written early difficulties usually have receded, or are overshadowed by the more pressing contingencies of completing the analysis and meeting writing deadlines.

Background of the Study

For reasons well known health officials have long been interested in the

relationship between the housing environment and health. In a number of studies it has been repeatedly observed that disease rates are higher among persons who are poorly housed than among those who are better housed,¹ though there are very few studies reporting the reverse relationship. The common inference is that components of bad housing environment, that is, inadequate sanitary facilities, crowding, the presence of vermin, and the like, are responsible for the higher disease rates.

This is, of course, not the only interpretation possible. Another, for example, suggests that it is not the housing environment itself that encourages the incidence of disease. Rather, the hypothesis is advanced that the population living in a poor housing environment has certain characteristics which—aside from housing—result in a high observed prevalence of disease. These characteristics are: low income, little education, poor diet and health habits, and a lessened proneness to seek out medical attention when needed. Thus, the issue may be people rather than housing, or at the very least some complex interaction between the two, and the relationship between housing and health, while repeatedly observable, may simply not have the causal direction that is popularly accepted.

For a number of years the Joint Committee on Housing and Health of the American Public Health Association and the National Association of Housing Officials had been interested in

formulating a study to test, unequivocally, the effects of housing quality on health (defined broadly) and other matters of kindred interest. It was decided to expand the emphasis to include measurement of social behavior and other indicators of social adjustment as well as of health. Members of the Joint Committee explored with the School of Hygiene and Public Health at Johns Hopkins the feasibility of such a study to be carried out over a period of several years under the auspices of the school. By 1952 the project was under active consideration by several members of the faculty who, together with two housing officials, constituted a steering committee.

Basic Study Design

A number of possible approaches to over-all study design were sifted by the early planners of this study, the final decision being to locate a population that was known to be moving from "bad" to "good" housing, to make measurements before the move, and continue to make them for three years after. In order to evaluate the role of housing quality in such changes that took place provision was made for a control group, matched as closely as possible to the test group, who would undergo measurement at analogous time intervals. A practical consideration that influenced choice of this design was the possibility offered by low-rent public housing developments. Public housing developments are typically occupied by tenants who have demonstrated housing need. Thus there would seem to be in newly moved public housing residents a ready-made test group with the appropriate, before-and-after housing characteristics.

The study, as it has evolved, is indeed concerned with public housing. Our test group consists of 400 families who are moving from the slum in a large eastern

city to a newly constructed housing project that will hold 800 families when fully occupied. The reason for this fairly large number of test families that will number about 2,000 individuals is that we would like to track down specific housing conditions that may be affecting certain end effects we will be measuring. To this group of test families have been matched approximately 600 control families. The reason for this particular number of controls is frankly that we expect greater loss from this sample than among the test families, before the three-year period of data collection is over.

The basic study design involves a single before-measure of both test and control families, followed by a series of after-measures. The primary source of data is the home interview with the female head of the household. The before-interview was conducted with the test families prior to their being informed that an apartment would be available to them. The before-interview with the matched control families was conducted as soon as possible after the test family had been interviewed. Subsequently, all families are to be inter-

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viewed every two months on health matters and annually on matters relating to adjustment for a period of three years. Selected social adjustment issues will also be taken up in the bi-monthly health interviews. By April, 1956, we had selected the test and control samples, had completed initial interviews with all families, and were under way with the first wave of re-interviewing.

A second source of data for measurement of health and adjustment is public records in the schools, courts, social, and similar agencies in the city. Cooperation has been promised for this valuable additional source of information about our test and control families.

These are, of course, only the bare details of the study. A brief description of some of the details will illustrate our approach to the problems of measurement and design.

Content and Data Collection

Housing Quality—Our first concern had to do with the measurement of housing quality. While we had available to us the evaluations of the housing authority's home visitors, it seemed desirable for reasons of uniformity to assess this matter for ourselves for every test and control family in the initial interview and again when a family moved. After many discussions with persons qualified in this area we concluded that no extant method as it stood would serve us perfectly. The housing quality measurement we evolved consists, primarily, of an adaptation of Allan Twichell's shortened form of the APHA Appraisal Method.² We have added to it indicators of crowding and sleeping arrangements and have also included indexes of general dilapidation derived from the recent experience of the Bureau of the Census. Our home interviewer fills out the housing quality schedule from questions asked of the

respondent, as well as from on-the-spot observation.

Morbidity—Our next concern was the measurement of health. What should we look for? For all that has been written on this topic few commentators have been able to sketch in direct relationships between particular aspects of housing quality and particular disease entities. The best informed guesses were that a number of specific conditions are likely to stand out as a function of three years' difference in housing quality conditions. We will be asking about these conditions in particular as time goes on. Through our detailed assessment of housing quality we may be able to single out the housing components related to specific conditions. These conditions and their hypothesized relation to housing components are:

First, the less serious acute respiratory infections like colds, bronchitis, and grippe may be related to such housing characteristics as shared use (with other families) of toilet and water facilities, inadequate heating or ventilation arrangements, inadequate and crowded sleeping arrangements, etc.

Second, certain infectious diseases usually associated with childhood, such as measles, chicken pox, and whooping cough, also may be related to housing characteristics similar to those described for the respiratory infections.

Third, minor digestive diseases, such as upset stomach, food poisoning, diarrhea, and enteritis may be related to poor facilities for the cold storage of food as well as inadequate washing and toilet facilities.

Fourth, in connection with home accidents it is not unreasonable to suppose that there may be a higher incidence of cuts and burns originating during the preparation of food in crowded or inadequate kitchens, flash burns from poor electrical connections, or falls due to tripping in crowded rooms or on dark and unstable stairs.

A fifth category has to do with infectious and noninfectious diseases of the skin in which the relevant housing characteristics may be facilities for washing and bathing, as well as overcrowding.

These are general categories which directly suggest themselves as susceptible of examination in the light of the basic hypothesis when we examine particular housing characteristics. Several other disease categories may also be considered that are perhaps less related to particular housing conditions and more related to the whole constellation of health-related housing inadequacy in the slum. Thus, poor housing quality may contribute to lowering of the general level of resistance to many diseases among the slum families. If this is so, we may expect in the slum a higher incidence of such serious conditions as pneumonia. Moreover, it seems reasonable to believe that everyday living is "harder" in the slum than will be the case in the housing project. "Harder" living may conceivably affect exacerbation (if not onset) of certain chronic conditions: various heart ailments, arthritis, etc.

Thus far we have outlined our hypotheses regarding the relationship between the incidence of specific illnesses and housing quality components. We may find, however, that components of housing quality do not affect specific incidence as much as they affect the duration of illness and the length of the recuperative period that follows.

The method we are using to collect physical health data is the morbidity interview with the female head of the household, conducted by a trained lay health interviewer. In particular we are using the format developed in recent years by the Bureau of the Census: a large fold-out form on which we enumerate all kinds of conditions for each household member. In the initial interview we concentrated primarily on

medical history, including history of chronic conditions and complaints, although we also asked for any and all kinds of sicknesses that occurred during the past two months. In subsequent interviews we are continuing to ask about illnesses and, in addition, accidents that took place in the two months preceding the interview, and for each condition or accident are recording duration, medical attention received, and extent of disability incurred.

Adjustment—Our third major concern pertaining to content and data collection was the measurement of personal and social adjustment. To be sure, our plan includes comparison of our two groups on such extreme indicators of "adjustment" as appearance in records of police courts and mental hospitals; we also will be singling out incidence of neuropsychiatric conditions or complaints from the morbidity survey in this connection. However, it is agreed that these are not the only indicators of adjustment. While many writers have commented on the relationship between housing quality and adjustment, most have simply agreed that better housing is related to better adjustment without sufficiently specifying, conceptually, the way in which this happy result comes about.

In formulating our hypotheses we listed systematically the many ways in which the new dwelling units would differ from the old and focused on those we felt would play important roles in the interpersonal behavior and attitudes of family members. We have followed the leads of writers like Chapin,³ Merton,⁴ and Lemkau⁵ in singling out four hypothesis areas on which we will be obtaining data in our study. These areas have to do with (1) relations within the family, (2) relations with neighbors, (3) aspiration level, and (4) community identification. In a fifth division we have attempted to measure some of the characteristic feeling states

and emotions of our respondents, through the use of unidimensional, social-psychological scales especially constructed for use with our population.

The basic instrument for measuring adjustment is a structured interview schedule administered by our interviewers. To illustrate one of the hypothesis areas we are asking about the opportunities our respondents have for privacy when they want it, about frictions that arise in the dwelling unit, about the general compatibility of family members; we are learning about staying-at-home habits of our respondents and about the extent of intrafamilial activities and cooperation and warmth within the family. As with health, we shall attempt directly to assess the importance of housing quality components in these various elements of intrafamily life.

Problems of Data Collection—We have encountered a number of problems in connection with the actual use of our schedules in the field. One of the first was the length of the initial, or before-interview. Since we had only a single opportunity to obtain before-measures on the families who were to move to good housing, we had to cover all three of the major content areas mentioned above: housing quality, health, and adjustment. After some early experience with interviews that were unfeasibly long, we had, in fact, to abridge rather ruthlessly some of our forms to meet the contingencies posed by housing authority time schedules, by good interviewing practice and management, and by budgetary limitation. All researchers will appreciate the pain this necessary surgery caused to the study staff.

Of equal importance has been the problem of finding, training, and keeping suitable interviewers to do the field work. There are, for example, some intrinsic factors damaging to the morale of our field workers and making for interviewer turnover. At least for the

initial interview all our families live in the city's slums, some in the very worst kind of slums. Moreover, night calls are sometimes necessary in unsavory neighborhoods.

Aside from interviewer morale and turnover there is the problem of response variation attributable to the interviewers. Interviewer biases are important factors in the proper interpretation of all survey data. When one adds a longitudinal aspect and, over and above that a two-group-comparison aspect to a study, the effects of interviewer biases may be even more disturbing. From the beginning of the interviewing we have been making separately for each interviewer current and repeated hand tabulations of responses to selected questions. Our concern is least in connection with the adjustment and housing quality schedules in which most of the items are precoded. Extensive training procedures have evidently resulted in very little interviewer influence on the distribution of responses to such questions. The morbidity schedule causes us more concern. Interviewer variance, despite extensive training and retraining, is still sizable in this schedule, where many items are of the free answer variety. This particular problem is not discussed often enough in connection with morbidity surveys. Our present experience is leading us to make drastic revision in the way in which we will be asking morbidity questions in the regular bimonthly survey.

Problems of Administration

All field studies have their own problems of administration. Two—in this particular study—come to mind as especially worthy of discussion. The first concerns our working relations with the housing authority. This agency is responsible for the buildings, the tenants, and the management of the

housing project that is the focus of the study. The most complete cooperation possible was obviously essential to the success of the study. This was made possible from the very start by virtue of the fact that housing authority personnel were on the earliest committees planning the study and today are on its advisory committee. These persons provided valuable liaison between the study staff and the housing authority. Thus many resources within the authority were made available to us because of the good will and interest of authority personnel. We spent months abstracting the application files from which preliminary information about our test families, and as it turned out, our control families as well, was to come. From meetings with tenant selection personnel came a clear statement of tenant selection procedures. When the authority, applying its usual procedures, chose the successful applicants, we were at that point permitted to select the test sample and to interfere, to a certain extent, with what usually would then follow in housing authority practice.

We have no complaints about the cooperation we received, nor about the attitude of the authority toward the study. Our problems arose primarily out of the fact that our study, like so many field studies, was an appendage to a service organization, and the necessities of carrying out a complex design left us at the mercy of the ordinary contingencies of the agency. We learned quickly that we had to be adaptable. At almost every stage we had alternative plans worked out depending on the way things would develop at the housing authority, sometimes investing considerable time or money or both in setting up double sets of procedures. For example, beginning in April, 1955, and for five or six months thereafter, the office of tenant selection chose successful applicants a small bloc at a time, enough to fill buildings as they became ready.

This procedure in itself gave rise to repeated short-notice peak loads with stringent deadlines resulting in noticeable strain on the interviewing staff.

Another, more serious problem, also arose out of the necessity for gearing our activities to those of the housing authority. The criteria which we established before the actual selection of our test sample began were to take into the sample those families who would be most likely to be matched from our control reservoir and who would be most likely to remain in the test sample for the entire three-year period of the data collection. In the early blocs the test families who met our criteria constituted a very small proportion of the incoming families, and we had no guarantee that the proportions would change in our favor. As a consequence of having to build up our test sample as the housing project was being filled, we were forced to include a large number of families who did not meet our criteria of matchability and stability. As time went on the proportion of families who did meet our criteria increased and we found that needless time, effort, and money had been invested in what at the time appeared necessary insurance.

Another administrative problem had in part to do with the housing authority, but also was part of a larger issue. What was to be said to the public at large about the study and in particular to the families in our test and control samples? There has naturally been a good deal of interest in the study among newspapers and among diverse persons in the community. Our own point of view was that the less said the better, inasmuch as the effects on continued cooperation of families were really unknown, and perhaps more important, the effects on responses of persons answering our questions would be very difficult to gauge if the whole experimental design were known to all. This is a somewhat different situation from that confronting

other surveys where publicity may well step up cooperation from participating families. The outcome has been good cooperation from the housing authority and the press, the former not saying anything to applicants about the study, and the latter agreeing to minimal publicity until such a time as the news of the study can do the study process no harm.

Problems of Matching and Attrition

Perhaps the most serious problems we have faced are those involved in selecting test families and obtaining satisfactory matched controls who, with reasonable probability, will continue to remain true controls for the period of the investigation. For, if our groups are from the start markedly uncomparable, or if there is radically biased attrition, unequivocal conclusions will be very hard to reach, despite all the subtleties that sophisticated analysis of data can bring to bear.

The problem of initial comparability and sample attrition are complexly related in our study, due primarily to the reservoir from which our control families were to come. We have already mentioned the fact that our 400 test families were to come from among the 800 whom the housing authority designated for the project and we have described the piecemeal way in which lists of successful applicants were made available to us.

From among various alternative possibilities we had very early decided to choose control families from the housing authority applicants who remained after the project residents had been chosen. Among the several advantages of this plan was that it insured gross comparability of test and control groups on certain socioeconomic factors, on overall housing need, and, probably in addition, on the social know-how that leads

people to make application. Two outstanding disadvantages of the applicant files as control source were the possibility that the project families, having been chosen sooner than the remainder, were different from the remainder in some significant way, and that the remainder, being still applicants for public housing, would suffer steady attrition as time went on.

A careful study of the application files led to the conclusion that by applying certain principles of selection to our test families we could in all likelihood find a sufficient number of stable, well-matched controls. As a consequence we excluded white applicants from and held to a minimum the number of nonwhite veteran applicants in our test sample. The reason for this was that we could expect matched controls to both these groups to suffer heavy attrition in the first year of the study, the white controls because the over-all white control reservoir was small, and the nonwhite veteran controls because veterans have highest priority for assignment to dwelling units in all the projects of the city.

We used the pairing method of selecting matched controls.⁶ Information from the entire file of applications in the control reservoir was recorded on McBee cards as well as the information from the applications of test families. Since our aim was to obtain 600 control families, we had the option of matching at the rate of either one to one or two to one depending upon the family size and composition stratum we were dealing with. Thus, for example, we matched middle-sized test families, with husband present, at the rate of one to one because the control reservoir for this stratum was small. On the other hand, we double-matched small-sized test families because the control reservoir for this stratum was large and because it is here that we expect the highest attrition rate.

We matched on 13 variables which we have reason to believe play a role in health and adjustment. For example, we matched on certain family composition items, such as age of the female head of household, age of oldest child, number of children, and whether the husband is present in the household or not. Other matching variables have to do with income, occupational status of the woman of the house, and whether the family is receiving public assistance. A further item has to do with the quality of housing as recorded by the housing authority's home visitor. Finally, we were interested in matching on length of residence in the city, the original application date and recency of renewal of the application. On some of the items mentioned we considered a match satisfactory if the test and control families occurred together in the same fairly broad category.

After the initial matching was completed, we allowed a two-month period for re-assessing the goodness of matching on both a pair-by-pair and a group basis. The items assessed were not only the original matching variables—brought up to date on the basis of the initial interview—but also certain additional indicators of initial health and adjustment. The assessment of initial comparability revealed some test-control mismatching on a pair-by-pair basis and, as a consequence, inequity on certain variables on a group basis. We rematched the errant pairs from a sizable control pool that had been built up, using the up-to-date data from the initial interview. We are now satisfied that we have, at the outset, two well matched groups of families.

Space does not permit complete discussion of the problem of attrition from the samples nor a detailed account of our analysis plans in the face of sizable attrition. We do not expect that our greatest difficulty will arise from families being lost to our samples by virtue

of moves to unknown addresses which we are prepared to go to some lengths to locate. Our biggest problem will arise from the fact that our control families remain applicants for public housing, and as dwelling units become available in all the city's projects they, along with all other still active applicants, become candidates for these dwelling units. Some of our controls will undoubtedly, therefore, remain available to us for further examination, but by moving into a housing project will have changed their housing quality considerably for the better. Both possibilities—outright loss and loss from housing quality change-over—have serious implications for the ultimate analysis of the data. A number of different analytic procedures have been considered depending on the long-range stability of our test and control groups as originally constituted. We have, incidentally, decided against replacement of "losses" from whatever source, as introducing many unknown kinds of bias. The advantage of pair-by-pair matching at the outset is that a number of different kinds of analyses are possible to provide different approaches to answers to the basic questions of the study.

Summary

We have presented some of the plans and procedures of a controlled longitudinal study, now under way, concerned with the effects of housing environment on health and adjustment. We have also described selected problems, both present and anticipated, several of which stand in the way of unequivocal answers to the question the study poses.

Some of these problems are transitory and are part of the general difficulty of conducting research necessarily tied in with the activities of another organization. Others are of longer duration and are intrinsic to the design of the study; these are the problems of measurement,

selection of samples, and projected analysis that will lead to the least ambiguous conclusions.

Our difficulties are part of the general process of translating study plans into action. Extra vigilance, it seems to us, is called for in the various phases to insure the best possible implementation of the study design. This vigilance includes the readiness to stop the collection of data for study before the projected terminal date if it appears that further activity is unprofitable.

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Safety Films Screened for Quality

The National Committee on Films for Safety held its annual screening session in Washington on April 11 and 12, 1956. Of 70 films submitted, 24 received special recognition; nine were awarded plaques to signify outstanding achievement, 15 received awards of merit. Of the 24, ten were in the occupational field, eight in traffic and transportation, five, general, and one on home safety of only two submitted.

Arthur Kneerim, director, Field and Health Agencies Bureau, Metropolitan Life Insurance Company, represents the American Public Health Association on the committee. He reports "a general improvement in the calibre of the entries" and "several films on the community approach to safety." A list, with brief description of the award winners and source from which available, may be obtained from Mr. Kneerim, One Madison Ave., New York City.