

PUBLIC PARTICIPATION IN
MEDICAL SCREENING PROGRAMS

A Socio-Psychological Study

By

GODFREY M. HOCHBAUM, Ph. D.

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Public Health Service

Bureau of State Services

Division of Special Health Services, Tuberculosis Program

Preface

The screening of large population groups for a variety of diseases has brought many social and psychological problems to the fore. Chief among these are problems that concern motivation. Why do people accept or reject opportunities to discover their health status?

This question is fundamental in any medical screening program. It is crucial in X-ray case-finding activities in the field of tuberculosis.

The study reported here utilizes behavioral research techniques in what we believe to be a unique inquiry into the sociopsychological factors that influence participation in public health screening programs.

Since tuberculosis has been the object of the most extensive and intensive case-finding activities, it has served as source material for this research undertaking. The findings, however, have realistic application to screening activities in other disease detection programs.

We believe that these findings, if judiciously utilized, will enlighten and guide future planning of mass or group screening programs, particularly in their educational and motivational aspects. In addition, the methodology of this research project should provide ways and means of seeking out the well-springs of behavior in many social and medical contexts, which otherwise might remain as mere conjecture and assumption.

This study was sponsored jointly by the National Tuberculosis Association, the Tuberculosis Program and the Public Health Education Services of the Public Health Service, U. S. Department of Health, Education, and Welfare.

James E. Perkins, M. D.
National Tuberculosis Association.
Edward T. Blomquist, M. D.
U. S. Public Health Service.

Public Health Service Publication No. 572



Acknowledgments

This study was undertaken under the joint sponsorship of the National Tuberculosis Association, and of the Tuberculosis Program and the Public Health Education Services, U. S. Public Health Service.

Many persons in each of these organizations have at one time or another lent their support and contributed their ideas to the project. Particularly instrumental in making the study possible were Mr. Sol S. Lifson, Director, Health Education Division of the National Tuberculosis Association, and, in the Public Health Service, Dr. Robert T. Anderson,* former Chief of the Division of Chronic Disease and Tuberculosis, Dr. Edward T. Blomquist, Chief, Tuberculosis Program, and Dr. Mayhew Derryberry, Chief, Public Health Education Services.

The author is particularly indebted to Dr. Andie L. Knutson, former Chief of the Experimental and Evaluation Branch,** whose earlier work and thinking strongly influenced this study and who, through his experience and skill, helped professionally as well as administratively to steer the project through many a difficult and critical stage. Much credit goes also to Mr. Lee Meltzer, Dr. Ben Shimberg, and others who, as members of the Behavioral Studies Section, significantly influenced and added to the early thinking that went into the planning and design of the project.

Finally, the author wishes to acknowledge gratefully the help provided by those who critically reviewed the several drafts through which the manuscript went. Special credit is due Mr. C. A. Mills-paugh, Chief, Publications Services, Tuberculosis Program, and Dr. Irwin M. Rosenstock, Chief of the Behavioral Studies Section, whose work made the manuscript a better organized and better written report.

G. M. H.

*Dr. Anderson is now Chief of the Communicable Disease Center, Atlanta, Ga.

**Dr. Andie L. Knutson is now Lecturer in Public Health and Director, Russell Sage Project, University of California School of Health. The Experimental and Evaluation Branch has become the Behavioral Studies Section, Public Health Education Services, U. S. Public Health Service.

Public Participation in Medical Screening Programs

A Sociopsychological Study

Introduction

With the growing emphasis in public health on prevention and early detection of disease, there is an increasing need to enlist the voluntary participation of the public in health programs. Without such cooperation, many programs are destined to failure or to reduced effectiveness. Although the public stands to gain most from the success of health programs, its willingness to participate has all too often been disappointing, in spite of well-organized attempts to arouse popular interest and to make participation easy.

This paradox which affects many public health programs needs to be understood before we can increase the effectiveness of our struggle to control disease.

Unfortunately, the factors which determine whether people will respond to our efforts are many and complex. There is no single or simple answer to the question as to why some people respond while others do not. Nor are there any simple formulas which can be applied in the planning of public health programs to assure their success. However, behavioral research has important contributions to make, if the findings obtained are used judiciously and appropriately.

When mass screening surveys for various diseases began to be recognized as an effective weapon for public health, persuading people to submit to screening examinations became a fundamental and perplexing task. A typical example are the mass X-ray surveys, instituted on a national scale about 10 years ago. The familiar techniques of publicity, advertising, radio spots and announcements, community organization, the use of volunteer workers and committee action were unremittingly applied. On the whole, the results were good. But there was always, even in those places where success was most marked, a considerable number of people who rejected the opportunities offered them. There is reason to believe that tuberculosis is especially prevalent among this group. How could these people be reached? Why did they reject the opportunity for free X-rays that would tell them a great deal about the state of their health? As a corollary, why did those who appeared at X-ray installations consent to submit to a screening examination that might label them tuberculous?

The same questions have been and are being asked with equal concern in relation to methods used to screen for diseases such as diabetes, heart ailment, cancer, and others.

The study reported here was designed to help us answer such questions and to point to ways in which public health programs might achieve greater effectiveness. Although carried out in the context of tuberculosis case-finding, many of the findings of this study are also relevant to other screening and case-finding programs. In other words, the same or similar principles that apply to voluntary participation in X-ray programs are likely to apply to screening for tuberculosis by tuberculin testing, and to screening for heart diseases, diabetes, cancer, and other diseases.

The Act of Obtaining a Chest X-ray

When a person appears at a mobile chest X-ray unit, at a physician's office, or at a clinic to be X-rayed, it is the result of a decision made by him and translated into action. As with all human behavior, this decision involves a variety of factors. Some of them reflect the psychological state of the individual. This study identified some of these factors which were found to be of special importance to voluntary participation in case-finding programs. But psychological factors are not the only determinants of behavior. They do not exist in a vacuum; to produce behavior, they combine and interact with situational conditions, including social and physical factors.

The objective of the study, therefore, was to identify what specific combinations of these factors determine whether a person *desired* a chest X-ray, *when* he would seek X-rays, and to *what kind* of X-ray facility he would turn, as well as the *type* of educational influences to which he would probably respond. The selection of the situational conditions that were investigated followed to a large extent the findings and leads provided by previous research and the experiences of past case-finding programs.

Method

The data were collected through the use of a personal but standardized interview, consisting of about 90 principal questions. Several types of questions were used, all free-answer, and including direct and indirect, or projective questions. Specially designed pictures also were used to elicit responses. The interview, which required over an hour to complete, was designed to stimulate the expression of opinions, feelings, and attitudes concerning the psychological, sociological, medical, and administrative aspects of tuberculosis and tuberculosis case-finding. All responses were recorded as nearly verbatim as possible.

The interviewers also noted interruptions by respondents, signs of anxiety, resistance, and other emotions. Particular emphasis was placed on gathering reliable information about past experiences with the chest X-ray, especially with reference to when, where, and under what conditions they have been obtained.

Three cities were selected: Cleveland, Boston, and Detroit. The former two each had an intensive communitywide case-finding program around 1949. Cleveland, in contrast to Boston, however, had followed up this intensive program with a fairly steady educational and case-finding program, which was still going on at the time of the interviews. Detroit had never had a communitywide program, although a series of local case-finding programs had taken place. Thus, it became possible to obtain some clues as to which factors found to be significant to participation in X-ray programs were influenced by these types of educational and case-finding programs.

In each city, the Bureau of the Census selected a random population sample based on block listings. The samples were drawn from the city population over 25 years of age. A total of 1,201 persons were interviewed, 451 in Boston, 445 in Cleveland, and 305 in Detroit.

Each of the responses obtained was subjected to content analysis by specially trained personnel and codified in such a manner that the data could be analyzed by means of electronic computing equipment. All possible precautions were taken to guard against errors due to subjective biases on the part of the personnel who carried out all these processes.

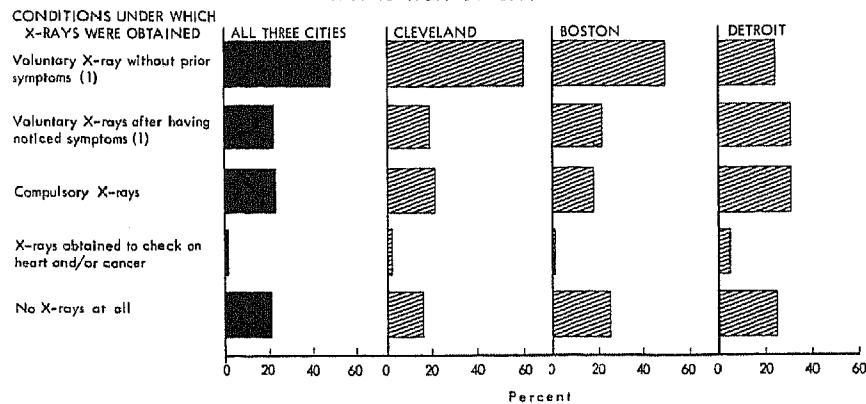
For the purpose of analysis, all chest X-rays obtained by respondents during the 7 years preceding the interview were considered criteria data. In other words, all the various factors investigated were evaluated against the degree and kind of actual participation in tuberculosis case finding of each single respondent. (Fig. 1 shows how many of the respondents in each city reported to have obtained chest X-rays under various conditions.)

Generalizing From the Findings of This Study

The question may well be raised whether and to what degree findings obtained in the three cities can be generalized to other communities or areas. There are two types of generalizations that might be considered.

The first one is that because a certain proportion of the respondents in these cities gave a certain answer, the same answer would be given by a comparable proportion in other United States communities. This generalization is based on the assumption that the three cities are representative of other United States communities. Such an assumption cannot be made in this study.

Figure 1
PER CENT OF RESPONDENTS WHO HAD OBTAINED AT LEAST
ONE CHEST X-RAY UNDER SPECIFIED CONDITIONS IN THE YEARS
1946 to 1952: BY CITY



(1) The term "TB symptom" refers to any sign or symptom, real or imaginary, which the respondents associated with tuberculosis, whether or not the association is medically valid.

NOTE: percentages add up to more than 100% because respondents may have had X-rays at different times under different conditions.

The second type of generalization is based on the assumption that a relationship between two factors, even though identified only in a limited sample, is of a universal nature and would be found elsewhere as well. For example, as will be reported in this paper, a highly significant relationship was found in the present sample between the belief that one might get tuberculosis and voluntary participation in tuberculosis case-finding programs. A plausible generalization would lead us to state that—although the number of people who so believe and the number of people who come for X-rays may be different in other communities—the *relationship* between belief and participation would be found to exist in all of them.

Such a generalization is probably valid since the findings here obtained show a high degree of internal consistency and are congruent with general psychological principles. In this connection it should be noted that the several relationships identified and to be reported here, did not differ significantly among the three cities despite the differences in the conduct of previous case-finding programs.

Findings

The role of psychological readiness

A person must be psychologically ready to act, and conditions must be opportune before he will take any action. The state of readiness required before a person voluntarily submits to any screening examination has many components which include knowledge, previous experiences, feelings, emotions, and others.

The findings revealed that basic to the state of psychological readiness to obtain X-rays are the individual's belief that he may contract tuberculosis at any time—indeed, that he may actually have the disease at the time of decision—and his belief that early diagnosis of tuberculosis would have beneficial effects for him, should he contract the disease.

At first glance, these beliefs seem to be merely a matter of information. However, knowledge may equip a person to give correct answers to questions but may not in any way influence his behavior. This point will be discussed more specifically later.

Belief in the possibility of contracting tuberculosis

Obviously, the views of the layman are not necessarily the same as those of the physician. To a major extent opinions are affected by things other than scientific facts and objective reasonings. It is fairly obvious, and strongly supported by research, that people act on their own beliefs, be they sound or not, and not according to cold objective facts. In other words, objective medical facts are not as important to the individual as his subjective beliefs and feelings. Thus, "symptoms" in this report refer to the respondent's interpretation of what constitute tuberculosis symptoms and not necessarily to medically valid interpretations of the disease. In short, we shall be concerned with what people believe, not with the correctness of these beliefs.

A person who is convinced that he is immune to tuberculosis cannot very well accept the possibility of having contracted tuberculosis. Even when he observes symptoms in himself which he knows often occur in tuberculosis, he may fail to associate them with this disease if he does not believe that he can possibly contract it.

While only very few respondents felt that they *could not* contract tuberculosis, many felt that they *would not* contract it. Psychologically the latter are not very different from the former—to either one the possibility of tuberculosis does not possess reality. They made up about 29 percent of the sample (fig. 2).

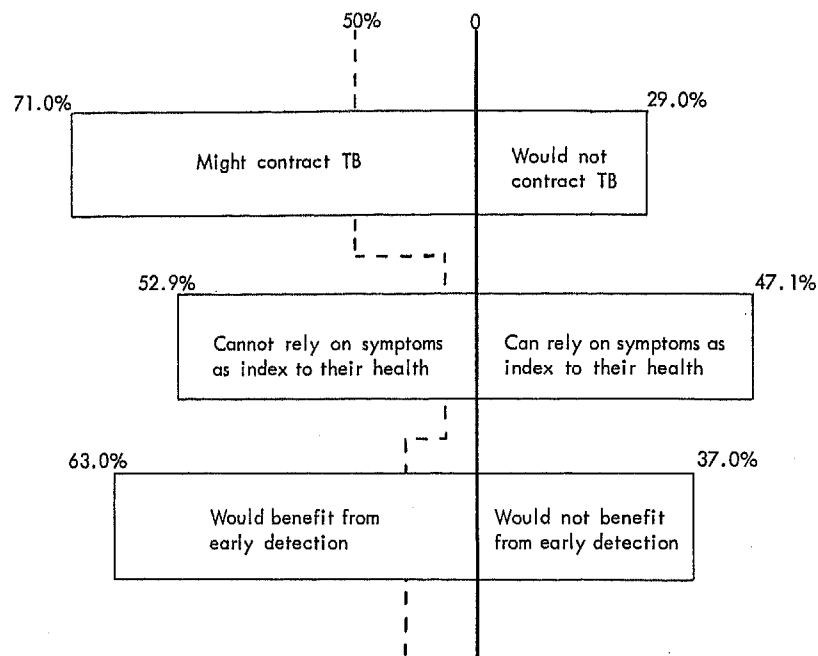
In the absence of noticeable symptoms, accepting the possibility of having contracted tuberculosis depends upon an additional belief: that the absence of such symptoms does not necessarily assure a state of health. In other words, the disease could in fact have been contracted although no symptoms have appeared as yet.

This concept can easily be expressed in words, but it is difficult to accept emotionally. How many of us—health workers and laymen alike—truly accept the fact that we may be suffering a serious disease while feeling perfectly well? Of course, there are wide variations in the degree to which different people embrace this belief in the sickness-without-symptoms concept. Yet, nearly half of the sample fail to accept it (fig. 2).

Figure 2

PREVALENCE OF EACH PSYCHOLOGICAL COMPONENT

Percent of Respondents Who Believe That They:



NOTE: Percentages are based only on 1,009 respondents. In the remaining 177 respondents one or more of the components could not be determined reliably.

The study data, in short, led to consideration of two possible situations. One involves a person who has become aware of symptoms. The other involves a person who has not noticed any symptoms. In both cases, psychological readiness to obtain chest X-rays requires—among other things—that one fully accepts the possibility that he may have contracted tuberculosis. In the case of a person who is not aware of symptoms, psychological readiness also requires a full

acceptance of the possibility that he could have a serious disease such as tuberculosis without noticeable warning symptoms.

Belief in the benefits of early diagnosis

It is hard to believe that there could be many people who either do not know or do not believe that early diagnosis plays a crucial role in improving prognosis and shortening therapy. Careful analyses of the responses to several questions led to the development of a code by which each respondent could be classified not only as to his knowledge of these facts, but also as to his acceptance of the idea that he could benefit from early detection should he ever contract the disease.

The breakdown showed that over 90 percent said early diagnosis in general would lead to better prognosis and shorter treatment. But only about 25 percent fully accepted and believed they themselves would benefit; about another 38 percent leaned in this direction; 28 percent had real doubts; and 9 percent definitely rejected the idea. Why do about one-third of respondents, most of whom are aware of the medical benefits of early detection, nevertheless express doubts of its value in their own cases (fig. 2)?

Our data suggest that many people worry less about prognosis or difficulty of treatment than they do about the effects of tuberculosis on such things as their ability to earn a living and to support their families. They seem to be anxious about the shattering of their careers, about the financial burden they would be for their family, or about the upbringing of their children. Many of these people do not feel that early detection of tuberculosis would do much to alleviate these problems. For these, detection of tuberculosis—early or late—may, with good reason, appear more threatening than beneficial. Therefore, it can hardly be surprising to learn that many such people tend to postpone getting chest X-rays or even avoid them altogether.

The data presented in figure 3 reflect the relationship between each of the three beliefs and participation in X-ray case-finding programs. However, in order to understand better the total process leading to participation, one must examine how these beliefs interact with each other and with other elements of the situation.

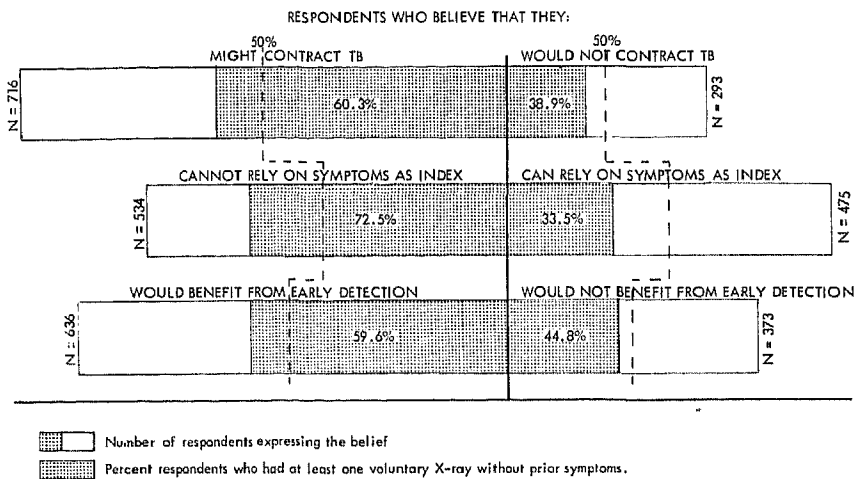
The role of situational factors

The factors described so far relate to a psychological readiness to obtain chest X-rays. Before this readiness can result in action, a number of other factors are required.

Some of these serve primarily to provide the opportunity for action. For example, X-ray facilities must be available; they must not require expenses which a person cannot afford; he must know or

Figure 3

RELATIONSHIP OF EACH PSYCHOLOGICAL COMPONENT TO VOLUNTARY X-RAYS OBTAINED WITHOUT PRIOR SYMPTOMS



be able to learn their location; he must have means to go there, and so forth. Most of these can readily be identified.

Of equal importance are factors constituting cues which instigate action. These cues touch off behavior when the individual is ready to behave, such as throwing a switch completes a circuit to light a lamp. The study identified two major types of such cues. One type consists of organic phenomena; that is, of physical changes in the body which are noticed by a person. The other type occurs in the external situation, such as posters, articles, TV and radio programs, the sight of a mobile chest X-ray unit, acquaintance with an active tuberculosis case, and a variety of other things which would focus a person's attention and feelings on tuberculosis and chest X-rays.

The interaction of psychological states and cues to action

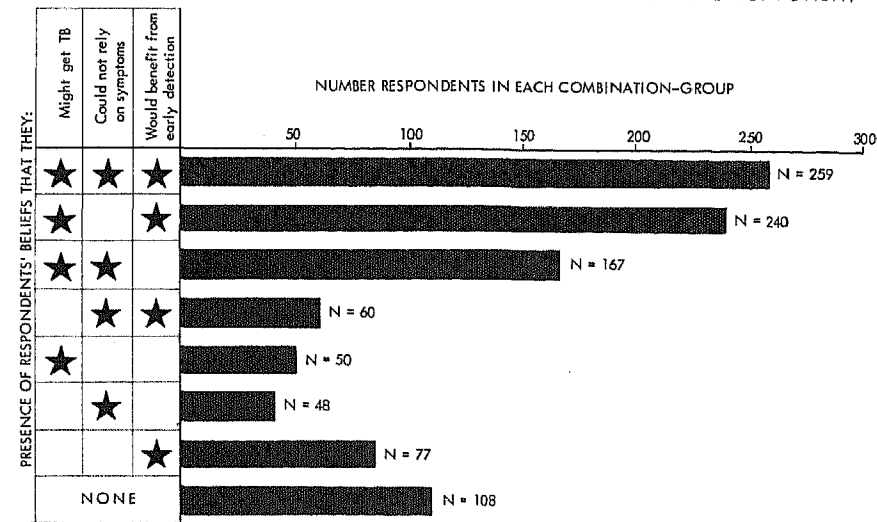
Various combinations of psychological and situational factors interact to produce decision. (See fig. 4 for the frequency with which the several combinations occurred in the sample.)

First, there is the person who fully *accepts the possibility that he can contract tuberculosis, who also accepts the fact that he might not be aware of having contracted it, and who believes that he would benefit from early diagnosis.*

If, as in this case, all three components of the psychological state of readiness are present, and if they are at maximum strength, it would presumably only be necessary that situational conditions provide an opportunity for him to obtain chest X-rays when the time has come for him to do so again. Normally, such optimal conditions rarely, if ever, prevail. Therefore, some external cues would be required to direct a person's attention to the fact that a certain

Figure 4

PREVALENCE OF THE SEVERAL COMBINATIONS OF THE PSYCHOLOGICAL COMPONENT

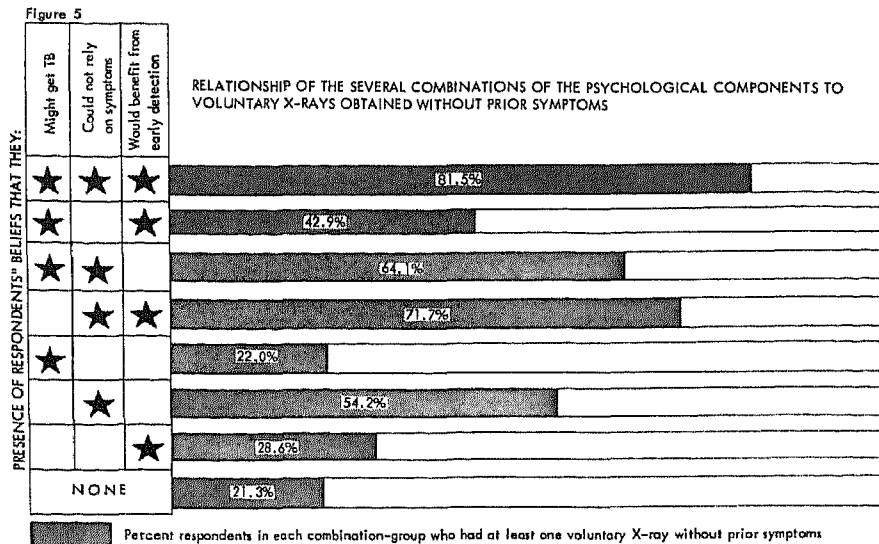


amount of time has elapsed since his last X-ray and that the opportunity for chest X-rays is available.

In any event, where the psychological state is characterized by all three components, only relatively minor cues should be necessary to trigger action, providing no barriers to such action exist and no negative forces are at work. Particularly significant is the fact that ostensible tuberculosis symptoms are not required, although their presence may serve as additional and intensified cues. Since this combination of the psychological factors represents an optimal state, voluntary participation among such people is higher than among people lacking one or two of the factors. Thus, we find that of 259 respondents who manifestly are in such a state of readiness, 82 percent have had at least one voluntary chest X-ray during the 7 years preceding the interview in contrast to 47 percent in the total sample (fig. 5).

It is of particular interest to observe that this high rate of participation is found among those who did not report that they noticed any alarming symptoms in themselves as well as among those who did report that they noticed such symptoms at one time or another.

In another combination, there is the person who believes that he can contract tuberculosis, and who believes that he would benefit from tuberculosis without being aware of any organic signs which he interprets as symptoms of tuberculosis. One may expect such a person to seek X-rays when he experiences what he thinks are symptoms of tuberculosis. However, since he normally considers the absence of such signs as valid evidence of his health, there is little likelihood that



he would seek X-rays as long as no symptoms arouse his suspicion and no other influences are exerted on him.

Two hundred and forty respondents in the sample believed they could get tuberculosis and also believed in benefits from early detection, but relied on the presence or absence of symptoms as an index of their health (fig. 5). One hundred and three among them report to have noticed symptoms at one time or another in their lives. Although about 90 percent of these had had voluntary X-rays, about two-thirds had had their first X-rays *after* they had noticed symptoms the first time. Nearly half of them had had X-rays *only right after having noticed symptoms and never again*. One hundred and twenty-two respondents with the same combination of components do not report to have ever noticed symptoms. Among these less than 38 percent had voluntary X-rays.

In another combination of the three components there is the person who *believes that he can contract tuberculosis and could have it without noticing symptoms, but who does not believe in the beneficial effects of early diagnosis in his case*. About 170 (over 14 percent of the sample) belong into this category. Nearly two-thirds of them had obtained X-rays voluntarily and without prior symptoms (fig. 5). As the data of figure 3 indicated, the belief in benefits from early diagnosis does not in itself have a powerful effect on participation. But this effect appears to be more pronounced when considered in combination with the other components. This is illustrated by figure 5 which shows that the rate of participation was 81.5 percent among those who held all three beliefs as contrasted to the 64.1 percent participation among those who did not believe in benefits from early detection although they held the other two beliefs.

Intensity of the psychological factors

It is interesting to conjecture—although no data on this point were obtained—that a low intensity in the psychological factors can probably partially be compensated for by greater intensity of situational factors. Thus, a person who only mildly accepts the possibility that he may contract tuberculosis may still be induced to be X-rayed if external stimulation is particularly strong. It may also be surmised that the more intense the psychological factors are, the less important, relatively speaking, situational conditions become. For example, if a person's state of psychological readiness is on a high level, he may require only the faintest external cues, to seek, or find ways of creating, the opportunity to get an X-ray where it is not already offered him.

The role of fear

It is known that the reaction of people to the thought of possibly contracting a serious disease can range all the way from complete and unbelieving indifference to an almost phobic fear. The interview used in the present study was neither designed nor sensitive enough to determine with any degree of accuracy where within this range the respondents stood. Still their approximate position relative to the two extremes could be identified.

Respondents leaning toward indifference were generally—though not entirely—those who did not believe that they would contract tuberculosis.

At the other extreme there were 16 respondents who seemed particularly intensely afraid. None of these 16 had had even one voluntary X-ray during the 8-year period.

Another 118 respondents showed signs of relatively strong fears in connection with the thought of getting tuberculosis. Their participation in case-finding did not follow any clearly discernible common pattern, although it was smaller than that of the rest of the sample (41 percent as compared to 47 percent for the total sample).

In analyzing the perceptions by these people of tuberculosis as expressed in the interviews, it became apparent that their fears took different forms.

In one form fear seems to be focused on specific aspects of the disease, such as discomfort, disfiguration, pain. This source of fear probably is relatively rare in the field of tuberculosis and of minor importance as a deterrent to seeking diagnosis, although it may play a major role in other diseases. Less than 2 percent of the respondents appear to feel such fear. In the second form the fear seems to be of the disease itself as a more or less vague, mysterious threat. The word itself has a frightening connotation, and the disease looms as an undifferentiated, frightening thing. This fear appears almost purely emotional with barely any intellectual component. Participation by

95 respondents who could be reliably placed into this category was relatively poor: only 29 percent had had one or more voluntary X-rays.

The third form is the one encountered most frequently among the respondents. Here, fears are focused on the consequences of tuberculosis. They are directed at economic and social factors, at the welfare of one's family, one's own disrupted career, and other similar consequences. Some of these fears may be exaggerated, and some may be based on misconceptions.

Participation by respondents whose fears are of this kind showed considerable variation but, on the average, was higher than that of either of the other categories (slightly over 50 percent). Attempts to establish more precisely the relationship between such fears and X-ray behavior remained inconclusive but did suggest that believing in benefits from early diagnosis may play a particular role with such people. Since they are concerned with specific problems which would arise should they contract tuberculosis, a thorough educational program dealing with such problems may decrease such fears. However, the fact remains that many of these fears are justified because they are based on real social and economic problems.

The choice of X-ray facilities

The decision to seek X-ray examination derives from a certain psychological pattern in the presence of certain cues. After the decision has been reached, there still remains a question of choice of facilities. Will the individual seek the mobile unit, his family doctor, a hospital, a clinic?

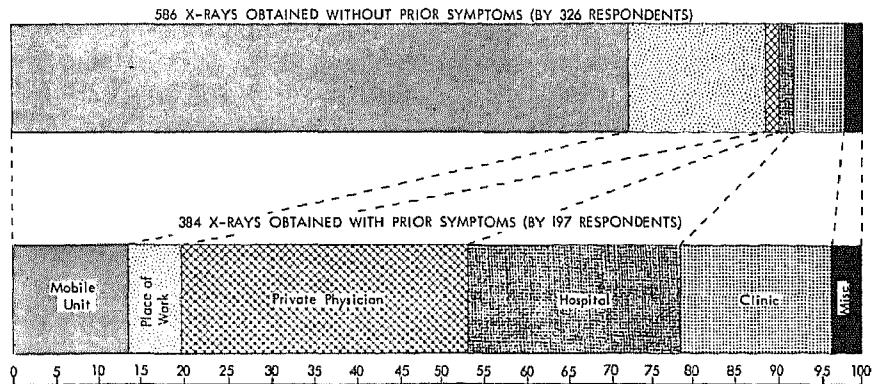
It is not entirely a matter of knowing where one can get X-rayed. Respondents in this study exhibited considerable knowledge on this score. When asked where one could get X-rayed, only 15 persons failed to mention any place. Sixty-eight percent mentioned mobile units; private physicians and clinics were mentioned by about 47 percent; more than 70 percent referred to hospitals. Nearly 99 percent named at least 1 facility; more than 82 percent named 2 or more; about 43 percent could think of 3 or more.

Obviously the choice of one type of X-ray facility over others cannot be explained primarily in terms of inadequate information concerning alternatives.

It is surprising to learn that, given some knowledge of several facilities, the choice among them apparently relates significantly to the kind of cue which impelled the decision to seek X-ray in the first place. Respondents who exhibited all three psychological beliefs for seeking X-rays and who made the decision to come because of situational cues without prior appearance of symptoms tended to come for X-rays to mobile units far oftener than to any other facility (fig. 6). Three-fourths of these respondents whose X-rays were stimulated only by external health appeals had obtained them at mobile units.

Figure 6

PER CENT OF X-RAYS OBTAINED AT THE SEVERAL FACILITIES WITHOUT PRIOR SYMPTOMS AND/OR IN RESPONSE TO PRIOR SYMPTOMS



Respondents whose X-rays were motivated by the presence of signs interpreted as symptoms show a very different pattern. Only 14 percent of their X-rays were obtained at mobile units, while nearly 34 percent were obtained from private physicians. Twenty-five percent of them went to hospitals and 18 percent to clinics.

There is a definite separation here with mobile units on the one side and private physicians, hospitals, and clinics on the other. How can these findings be understood?

They should be considered in the light of respondents' opinions about each type of facility. Each type is seen not so much as better or poorer, but as being fundamentally different. The mobile unit represents a facility where X-rays can be obtained easily, conveniently, and without charge. The physician is seen as offering more complete services—more thorough examination to determine the presence or absence of many disorders or diseases, rather than only 1 or 2. In addition, the physician offers treatment as well as diagnosis. The interpersonal relation between physician and patient is stressed by respondents. These features contribute to greater confidence in the physician than in the mobile unit.

The opinions of the respondents concerning hospitals and clinics are somewhat less clear. Hospitals appear to share in some of the "good" features of the physician, while clinics seem to combine the "free" services of the mobile unit with the more extensive examinations available from private physicians.

There is no difference of opinion between respondents who have had X-rays taken at the facilities they talk about and those who talk about facilities where they have never set foot. Nor are there any significant differences by age, education, or socioeconomic levels. The reasons given by the respondents for choice of facilities probably

represent stereotypes, held widely across the population, and are apparently largely independent of personal experience.

This study also suggests an explanation for the different choices of facilities made by persons who obtained X-rays because of apprehension that they might have tuberculosis and by persons who took X-rays based on knowledge of the value of a checkup. The latter may be concerned about the possibility of tuberculosis, but this concern is under rational control. They probably feel fairly certain that they do not have the disease. They seem to come to the X-ray unit much as a good student comes to a test. While they may entertain doubt and anxiety, they tend to feel rather confident that they will "pass." To such a person, the act of being X-rayed would be an experience that is completed when he receives the post card telling him he "passed." He has no reason to expect that the X-ray experience will produce any further consequences.

But what about the person whose psychological readiness was triggered into action by symptoms interpreted as possibly indicating tuberculosis? The possibility that he may have contracted the dreaded disease may arouse considerable emotion. He is more like a poorly prepared student who looks at the approaching test with dread since the possibility of failing presents a very real threat to him.

He may differ from the first person in still another way. For this first person, the X-ray report spells the end of the experience. For the person who responds to symptoms and who comes for X-rays with the expectation of a possible positive reading, it may mean the beginning of a whole series of unpleasant experiences. They would involve complicated medical, economic, and social changes. This man may very well see the act of being X-rayed as a door that may open on despair.

Once he has decided to seek diagnosis, it would be natural for him to seek a facility which not only can detect the presence of the disease, but which offers help in dealing with subsequent problems. In this context the physician can readily be seen as preferable to the mobile unit. He offers a complete and—as seen by the person—a reliable examination and diagnosis. The physician provides continuity in the event of a positive diagnosis, and he would assume responsibility for treatment. He would tell the patient what to do, prepare the necessary steps and start treatment. The mobile unit may detect the disease, but from then on the person is on his own and has to start elsewhere to manage and find help; the physician symbolizes not only diagnosis for one disease, but total diagnosis and help and advice and treatment. In short, the mobile unit appears to be used by people who expect to be told they are well; the physician by people who fear they will be told they are sick.

Knowing—Believing—Acting

The persons interviewed were reasonably well-informed about tuberculosis and the role of chest X-rays in diagnosis.

About 85 percent of the respondents were sure, and another 5 percent "believed" that tuberculosis is contagious. Nearly 97 percent seemed aware of the importance of starting treatment for tuberculosis early. More than 80 percent stated that chest X-rays could detect tuberculosis in a person before he notices any signs or symptoms of the disease. The question of whether a baby can be born with tuberculosis was answered in the affirmative by about 49 percent, in the negative by 32 percent; the rest felt unable to answer.

Only 1 percent expressed spontaneously a definite and strong view that X-rays are dangerous, although another 4.5 percent inclined to that view. These data, however, were collected before public discussion of radiation dangers had developed to its present extent. Concern with danger from X-rays would probably be expressed by a far larger proportion today.

Not counting the rather ambiguous question of whether babies can be born with tuberculosis, 865 respondents gave acceptable answers to all information questions. Of these, 49 percent had obtained at least one chest X-ray voluntarily and in the absence of symptoms of illness. Of another 197 respondents who gave predominantly correct answers, 44 percent had one or more such X-rays. Of the 124 respondents (11 percent of the sample) who gave predominantly unacceptable answers, 41 percent had one or more such X-rays.

This difference in participation in case-finding programs between well-informed and poorly-informed respondents is not an impressive one. Does this mean that being informed about tuberculosis and X-rays has no bearing on whether or not people will obtain X-rays? Or does it mean that we have to consider more complex relationships between what people know and what people do?

The interview contained some questions which queried the respondents in very direct fashion concerning their information or views on a given topic. However, on some of these topics, the interview included several additional questions, each trying to get at the respondents' beliefs and attitudes through an indirect approach.

In response to direct questions, over 80 percent of a group of 931 respondents stated correctly that X-rays could detect the presence of tuberculosis in a person before he would be aware of any symptoms. The remaining 19 percent stated that symptoms would appear before X-rays could detect the presence of tuberculosis, or, that people know when there is something wrong and that X-rays serve merely as a diagnostic tool. Forty-three percent among the correctly informed group reported to have had one or more X-rays between 1946 and

1953 voluntarily and without any signs of illness. Only 21 percent among the misinformed reported to have had one or more such X-rays.

Indirect questions elicited interesting responses. One question asked, while showing a picture of a mobile chest X-ray unit, "Why do you think some of these people are passing by?" Typical answers received were: "They seem healthy—there'd be no need for them."—"He probably feels O. K. It would be a waste of time."—"They all seem to be healthy and strong—I don't know about this one—but the others. They don't look like they have tuberculosis."—"Some may just be afraid to find out, but some don't need them, I guess. At least, they don't look like it."

Answers like these do not reflect a conviction that a person can have tuberculosis and not know it, or that feeling well and looking healthy are not reliable assurances of being healthy. The striking thing is that many of these responses came from the very people who, in answering direct questions, gave good evidence of being correctly informed on these points.

Other clues to inconsistency of belief were obtained. In the course of the interview, many respondents, who had given the correct answer to the direct question, inadvertently disclosed a deep conviction that they themselves would know, through symptoms, if they should ever contract tuberculosis. In other words, while they are able to state correctly the facts on an abstract level concerning people generally, they fail to relate these facts to themselves.

We have, then, the following types of respondents: (1) those who are correctly informed, appear to believe what they know, and also relate this belief to themselves; (2) those who are correctly informed but do not fully believe this information, or fail to relate it to themselves; and (3) those who are misinformed.

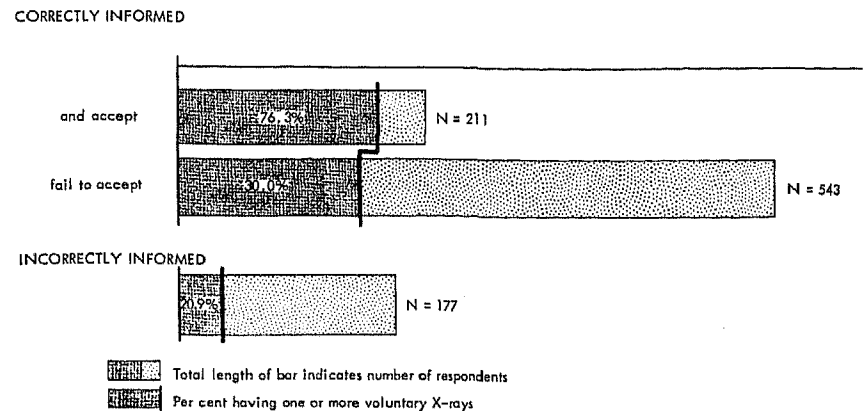
There were striking differences in the voluntary X-ray behavior of these three groups clearly indicating that, while information is an indispensable factor behind specific action, it is not, by itself, sufficient to produce action (fig. 7). People learn to give correct answers to questions before they learn to believe what they say and long before they use this information to guide their behavior.

A special case of the failure to believe is found where a person possesses some information which relates to how people ought to act but fails to believe fully that he himself is included. When such a person says, "People should have a physical examination once a year," he literally does not perceive himself as included among "people;" hence, as far as he is concerned, the rule which he himself states does not apply to him.

Thus, information is depersonalized, isolated from the springs of behavior. Information alone is not a motivating force, although it is basic to most behavior. Without knowing what to do and how to

Figure 7

INFORMATION ON AND ACCEPTANCE OF THE FACT THAT ONE CAN HAVE TB WITHOUT SYMPTOMS



Excluded from total sample of 1186; those whose "information" and/or acceptance could not be established and/or who had more than two compulsory X-rays.

do it, one cannot act. But only when this knowledge is related in some way to one's needs will it actually be translated into action.

To summarize, the group of respondents which accepts and fully believes the pertinent information about tuberculosis shows the best participation rate in case-finding programs. Within the group which can correctly report on the point under consideration but fails to make the information an integrated part of their beliefs, participation is much poorer. The incorrectly informed group exhibits the lowest rate of participation.

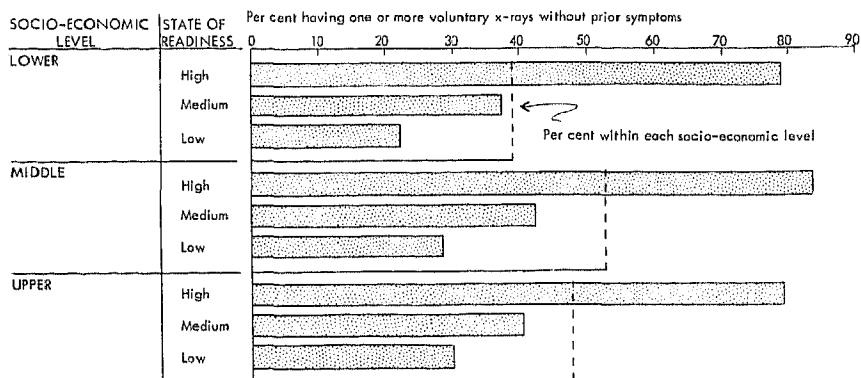
Psychological factors and low-participation population groups

During the past few years, the emphasis in tuberculosis casefinding has been shifting from the communitywide program to the program focused on groups in the population which are believed to be characterized by high prevalence and low participation in casefinding efforts. There is evidence that older people and people in the lower income brackets belong in this category. The present study revealed that it is in these very groups that the three psychological beliefs—so closely related to voluntary X-ray behavior—are most notably lacking.

Indeed, it was found that people who believe they might contract tuberculosis, who believe they themselves may not be aware of the presence of the disease, and who believe they would benefit from early detection, are likely to come for X-rays whatever may be their age or their socioeconomic level (fig. 8). Those who lack one or more of these three beliefs tend to refrain from seeking X-rays, again regardless of age and socioeconomic levels.

Figure B

RELATIONSHIP OF SOCIO-ECONOMIC LEVEL, STATE OF READINESS, AND PARTICIPATION IN X-RAY PROGRAMS



Of 1186 respondents, 201 were excluded because of difficulty of establishing their socio-economic level and/or their state of readiness.

State of readiness:

High..... All three components present or two of them particularly strong.

Medium... At least two components present, or only one particularly strong.

Low..... None of the components present, or only one but not particularly strong.

The effect of being X-rayed on subsequent voluntary participation

The data collected in this study bear testimony to the fact that there has been much and impressive success in educating the public to the facts, at least in the three cities where the study was conducted. This is an important finding, for only an informed public can take sound health action. However, as was shown earlier, educational programs which merely provide information to people apparently influence primarily only those who are ready to accept. For those people who are not ready, something more than the provision of information is required. This suggests the need to emphasize the other aspects; to provide educational situations in which integration of information into one's accepted beliefs can occur.

The health educator may well raise the question whether the experience of being X-rayed in itself provides such a learning situation. In other words, does the experience of going into a mobile unit, being X-rayed, and receiving a negative report have positive educational effects on the person? Will it give him more favorable attitudes? Will he be more responsive to other health-educational efforts? Will it make it more likely that he will seek chest X-rays voluntarily in the future?

If it can be assumed that merely carrying out a given act tends to lead towards making the act a habit, our efforts might well be directed at getting as many people as possible to experience the act of being X-rayed at least once, in the hope that later they will seek X-rays of their own volition. If, however, the initial act has to be coupled with some additional psychological experience in order to lead to learning, our problem is far more complex.

Evidence that the latter is more likely to be true stems from an examination of people's experience with, and attitude toward, compulsory X-rays.

Respondents whose first X-rays had been compulsory can be grouped roughly into two categories. On the one hand there are those whose first compulsory X-ray was completely incidental to some other event, for example, X-rays given as part of a physical examination for induction into the Armed Forces, for admission to college, or to obtain a job. There are 102 respondents in the sample who experienced their first chest X-ray under such circumstances. A second group includes those whose first and compulsory X-ray was taken within the context of an explicit educational program. For example, some respondents recall that they were told what the purpose of the chest X-ray was; others mention a "campaign" that was going on; still others remember that they discussed the X-rays and their purpose with others in the group who had been required to be X-rayed. There are 74 respondents in the sample who can be assigned to this category.

Of the 102 respondents in whose cases the X-rays served some purpose not directly related to health, only 39 percent had sought and obtained voluntary X-rays subsequently. Of the 74 whose first X-ray experience, although compulsory too, was perceived in some health context, 53 percent had had subsequent voluntary X-rays.

This difference is statistically not significant. However, in conjunction with data which cannot be reported within the confines of the present monograph, it does suggest the applicability of the principle that what a person learns from an experience depends on the meaning which the experience has for him. Experiencing X-rays in a context that is not health-relevant presents a relatively ineffectual learning situation.

Social forces

Findings from this study indicate that persons who had had voluntary chest X-rays themselves knew of other persons who had had X-rays—friends, neighbors, coworkers. Persons who had not obtained chest X-rays knew of significantly fewer other persons who had. Furthermore, those who had obtained X-rays reported frequently that there had been favorable discussions of X-rays in social groups to which they belong. On the other hand, those who had not obtained X-rays, rarely reported any such discussion and, if they did, tended to recall unfavorable or indifferent comments.

Another manifestation of social influence lies in the frequency with which respondents reported to have obtained their X-rays when they were accompanied by other persons. Data strongly point towards mutual stimulation in such situations as the decisive factor that led to the participation.

From all this we may draw the implication that an increased use of social groups might be a useful means of increasing the effectiveness of our programs. It is likely that utilization of the dynamics of social groups may lead not only to a short-range increase in number of X-rays obtained but to a more fundamental change of attitudes. Particularly when dealing with populations such as minority groups with whom communication is difficult, mobilization of group resources may provide a powerful educational method.

Summary and Conclusions

The purpose of this study was to identify factors that determine whether and when people participate voluntarily in case-finding programs. The study was carried out within the context of chest X-ray tuberculosis screening programs.

The decision *whether, when, and where* to obtain chest X-rays was found to be largely due to the interaction of three sets of factors, the "psychological state of readiness" for the decision to obtain X-rays, situational influences, and environmental conditions that provide the opportunity of X-raying.

A. *The psychological state of readiness* or "tendency" to decide to obtain X-rays is composed principally of three components:

1. A belief on the part of the people that they themselves might contract tuberculosis.
2. A belief on the part of the people that they could have tuberculosis for some time without becoming aware of any symptoms or signs.
3. A belief on the part of the people that they would benefit from early detection of tuberculosis.

These components are not mere quotable knowledge but must involve certain elements before they become effective in promoting participation in X-ray programs. This point is presented by showing that the three components can be expressed by people on different levels:

1. As something they *know* and can explain, but do not really believe.
2. As something they believe, but see as something that applies only to others, not to themselves.
3. As something they not only believe to be true, but also as something they feel applies as much to themselves as to others.

Information on the first level and belief as described on the second level have, by themselves, little or no influence on people's decision to obtain X-rays. The "self-including" belief (third level), must characterize the components before they will form a state of readiness for X-rays.

B. The second set of factors comprises situational influences, among which the following appeared of special importance:

1. Any changes in bodily functions, observed and interpreted as possibly being symptoms of tuberculosis.

2. Influences exerted on people by others *toward* or *away from* the idea of obtaining X-rays. Included among such influences are social pressures, compulsion, medical advice, organized campaigns, and others.

- C. The third set of factors are represented by *environmental conditions*.

The opportunity to obtain chest X-rays must exist, and people must be aware of the opportunity. Related to this are the degree of convenience with which the X-rays can be obtained, the amount of time lost, necessary expenses, and other factors that may influence the degree to which people perceive the opportunity as available.

Assuming that these environmental conditions are such that obtaining X-rays is possible for people and that they present no strong barriers, then the decision whether, and when to come for X-rays has been found to be a function of the other two sets of factors. Various combinations of these are shown to have different effects on voluntary participation in X-ray programs. The most frequently found are these:

1. People in whom the psychological state of readiness comprises all three components (belief that they might contract tuberculosis, that they could have it without noticing symptoms, and that they could benefit from early diagnosis) are likely to participate with a minimum of external influences (such as posters, radio appeals, speeches, etc.). Furthermore, these people would be likely to seek X-rays even in the absence of any signs that they might interpret as tuberculosis symptoms.

2. People who believe that they might contract tuberculosis and would benefit from early detection, but feel safe as long as they do not notice any warning symptoms, will normally seek chest X-rays only if and when they notice what they consider to be tuberculosis symptoms.

3. People who do not believe that they would benefit from early detection can be expected to postpone X-rays even when they observe what they consider to be tuberculosis symptoms.

Even when this state of readiness is absent or of very low intensity, people were found to come for X-rays *in response to external influences alone*. These may be influences exerted by other individuals, or groups. In other words, people may come for X-rays not for any health-relevant reasons, but to please other people, to be accepted by their groups, and the like.

On the other hand, even where a state of readiness to seek X-ray exists and all the other factors appear to be favorable, people may

abstain from obtaining X-rays *out of fear of finding out* that they have tuberculosis. This fear appears to take on different forms:

a. Fear of certain aspects of the disease itself, such as pain, disfiguration, etc. Only an extremely small proportion of respondents expressed this kind of fear of tuberculosis.

b. General, vague fear of tuberculosis as an undifferentiated threat. People feeling this kind of fear are unable generally to point to specific aspects that frighten them.

c. Fear of specific consequences of tuberculosis, such as losing one's job, expenses, separation from family, etc. This is the most frequently encountered fear of tuberculosis.

Investigation of the circumstances related to *people's choices of X-ray facilities* disclosed that, in general, people appear to regard the mobile unit as a facility the function of which is merely to verify their feelings that they do not have tuberculosis. In contrast, they identify doctors and clinics with two things: a complete physical examination which will tell them either that they are altogether healthy or *what* is wrong with them and offer treatment, if necessary. As a consequence, people who feel reasonably confident that they are all right tend to go to mobile units because of convenience and economic considerations. People who are afraid that perhaps they might be sick—be it tuberculosis or something else—tend to stay away from mobile units and prefer private physicians and clinics.

Some evidence was found indicating that the *experience of being X-rayed in itself* has little effect on consequent voluntary participation unless it occurs in a context giving it health-relevant meaning. Thus, people whose first chest X-rays were obtained for a non-health-related reason, such as to get or keep a job, and without any other health-context, do not tend to obtain X-rays on their own later. People whose first chest X-rays were obtained for health-related reasons, or at least within a health-related context, are much more likely to seek X-rays on their own in subsequent years.

Because of some evidence as to *socioeconomic differences in participation* in case-finding programs as well as in prevalence of tuberculosis, the relationships of age and socioeconomic level to the three beliefs were investigated. It was found that among the respondents, participation in case-finding programs were poorer among the oldest and among the lower socioeconomic levels. However, it was learned that where the principle factors favorable to X-rays existed, people tended to obtain X-rays, regardless of age or social level; where these factors were not favorable, people tended to show poor participation, regardless of their age or social level.

This suggests that the reason for the lower participation of certain population groups lies in the fact that the three beliefs comprising

the state of readiness for X-rays are not as prevalent among these groups as among others.

It is felt that the findings presented here can probably be generalized to localities other than the ones in which the data were collected. Obviously the proportion of people who have certain pieces of information or who have any of the combinations of the three beliefs, or who come for X-rays, etc., will vary from place to place. But the principles identified here will probably be found to apply elsewhere, although their program implications would partially depend on local conditions.

In this connection, it is to be noted that, while the distributions of these variables differed in the three cities sampled, their interrelationship and their relation to actual participation in case-finding programs did not.

It also seems plausible that principles which were found to apply to casefinding in tuberculosis might also apply to casefinding in other diseases. However, before directly generalizing to such other diseases, one must be careful about considering differences in nature of the diseases themselves, in the way in which people react to them, and in the effectiveness of prompt start of treatment as seen by the public.

Nevertheless, the findings here suggest that similar principles are likely to be operative with the behavior of the public in other health areas.