

Department of Epidemiology
School of Public Health
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EPID 160

Principles of Epidemiology

Fall, 1967

Determinants of Response to a Health Program

*Health
relaxant
be however*

Epidemiology, until comparatively recently has been concerned almost entirely with a study of disease and disease process. Over the last few decades, however, it has become increasingly apparent that the same methods and principles used to further understanding in the determinants of disease could be applied to a study of selected aspects of human behavior. One such aspect of particular interest to the health professions has been the determinants of response (or lack of response) to health programs.

In the earlier approaches to this question, the conceptual frame was limited to the influence of physical variables, to the distance people have to travel, the state of the roads, the convenience of the times at which the programs were available, cost of attendance, etc. There is no doubt of course that such factors do have a bearing on the response rates to any program, but in general, modification of these factors has infrequently been found to result in major improvements in response rates.

The recent phenomenon of collaboration between behavioral scientists and health practitioners has led to a broadening of the conceptual frame to include at least two further sets of variables. One set of these has been psychological variables including cognitive processes (i.e., knowledge of the disease and its seriousness, knowledge of the program and its objectives for examples) and affective or emotional factors such as fear of the disease and its consequences. A second set includes social factors, particularly group membership and group norms. This formulation holds that human behavior cannot be fully understood (or modified) by studying the individual alone. Powerful determinants of behavior include the pressures exerted by the groups of which he is a member and the degree to which the norms and expectations of those groups are congruent with those of the professional groups responsible for the program.

These various formulations are of course not mutually exclusive, and it is not suggested that either physical (i.e., convenience) psychological or social factors are the cause of response or lack of response to any given program. Rather it is suggested that the degree of importanceⁱ of each set of factors needs to be ascertained in each situation and that the possibility should be born in mind that some of the factors may operate differently (in terms of determining response to programs) for different groups of people depending upon their social relationships.

This laboratory exercise is selected from data gathered in two studies of the epidemiology of oral polio vaccine acceptance.* In this study the effect of

* Johnson, A.L.; Jenkins, C.D.; Patrick, R.; and Northcutt, T.J., Epidemiology of Polio Vaccine Acceptance, Monograph No. 3, Jacksonville Fla., Florida State Board of Health, 1962.

Northcutt, T.J.; Jenkins, C.D.; and Johnson, ^{A.} A.L., "Factors Influencing Vaccine Acceptance," Chapter IV in Hillsboro County Oral Polio Vaccine Program, James Neil and James Bond (eds.), Florida State Board of Health, Monograph No. 6, 1964.

"convenience" factors was relatively unimportant as the vaccine was made available at no cost to the entire population of the county and was so widely dispensed as to be easily obtainable from a wide variety of sources.

The program in general was very successful. In the course of 10 weeks, 74% of the 561,772 people under age 40 (the target population) took the vaccine. The question then was how did this 74% differ from the 26% who did not take it.

To answer this question a representative sample of the population was interviewed after the 10 week intensive program to determine whether they had taken vaccine or not and to ascertain some of the social and psychological variables mentioned above. The preferred design for such a study would involve surveying a sample of the target population before the program to determine the distribution of the social and psychological factors and after the program to determine acceptance status. In this particular study this was not feasible.

Question 1: Why would this be the preferred design?

*selective recall
those who took
vaccine would
answer ques.*

The following data have been selected from the results of the study as illustrative examples. They are data from the sample of adult respondents aged 20-39 years (61% of this age group took the vaccine).

*different
than those
who hadn't
yet taken it*

*kills bacteria
a before
and after
study done -*

*selection
did operat
on recall*

Table 1: Knowledge About the Vaccine

"What was the name of the Vaccine?"	% Taking Vaccine
Don't Know	49
Correct Description	73
Total	61

Table 2: Knowledge of the Availability of Vaccine

No. of Vaccine Stations Mentioned	% Taking Vaccine
1 or 2	48
3	57
4	64
5+	77.5
Total	61

Table 3: Knowledge of the ^{CAUSES} ~~Courses~~ of Polio

How People Get Polio	% Taking Vaccine
Don't Know	51
Just Happens	62
Dirt, Flies	67
Germs or Virus	69
Total	61

Table 4: Personal Worry About Polio

Have you worried that you yourself might get polio?	% Taking Vaccine
Yes	64
No	60
Total	61

Table 5: Educational Level

Education	% Taking Vaccine
Some College	75
High School Graduate	63
Some High School	50
Grade School or Less	44
Total	61

Up to this point, some relatively simple tables have been presented showing the relationship of knowledge factors (Tables 1-3) and feelings or worry about polio (Table 4) to vaccine acceptance.

The final table (Table 5) can be interpreted in at least 2 ways. Educational level is ^{either} a further indicator of knowledge (that is the higher acceptance rates in the well educated are due to the increased knowledge of the program, vaccine and disease possessed by such people) or educational level is an indicator of the types of groups to which people belong. According to this view, the effect of education on program acceptance is independant of the effect of knowledge on such acceptance.

Question 2: BEFORE REVIEWING ANY FURTHER TABLES, construct your own set of tables indicating which results would allow the first interpretation and which the second.

Summary Tables.

Re-word ques.

actual findings controlled low ed. level

Table 6: Vaccine Acceptance by Knowledge About the Vaccine and Educational Level (Percentage Takers)

Education	What Was the Name of the Vaccine?		Total
	Don't Know	Correct Description	
Some College	63	83	75
High School Graduate	55	69	63
Some High School	42	62	50
Grade School or Less	32	55	44
Total	49	73	61

Table 7: Vaccine Acceptance by Knowledge of Availability of Vaccine and Educational Level (Percentage Takers)

Education	No. of Vaccine Stations Mentioned				Total
	1 or 2	3	4	5+	
Some College	62	68	72	86.5	75
High School Graduate	52	58	63	74	63
Some High School	41	47	61	72	50
Grade School or Less	38	57	47	-	44
Total	48	57	64	77.5	61

Table 8: Vaccine Acceptance by Knowledge of Causes of Polio and Educational Level (Percentage Takers)

knowledge of cause makes a difference to educate but not to less educated

Education	How People Get Polio				Total
	Don't Know	Just Happens	Dirt, Flies	Germs	
Some College	62	74	72	81	75 45
High School Graduate	56	67	68	65	63
Some High School	42	47	58	44	50
Grade School or Less	43	-	67	27	44
Total	51	62	67	69	61

Table 9: Vaccine Acceptance by Educational Level and Personal Worry About Polio (Percentage Takers)

no influence on educated but no influence on less educated

Education	Have You Worried That You Yourself Might Get Polio?		Total
	Yes	No	
Some College	74	75	75
High School Graduate	62	63	63
Some High School	52	49	50
Grade School or Less	58	38	44
Total	64	60	61

Question 3: What interpretations can be derived from Tables 6-9?

In an attempt to determine the influence of group membership, respondents were not only classified by educational status but by social class groupings. The social class of each respondent was determined by a score based upon the occupation, education and source of income of the head of the household. On the basis of these scores, the sample was then divided into 4 social class groupings ranging from Class I and II (high) to V (low).

Table 10: Vaccine Acceptance by Social Class

Social Class	% Takers
I & II	75
III	72
IV	56
V	39
Total	61

Appropriate tables were constructed to show that the social class effect was not due to increased knowledge among the upper social classes. The investigators then explored a further hypothesis. It was known (from other studies) that social class status is related to degree of social participation and it was suspected that people with the higher rates of social participation (both formal, that is belonging to many organizations, and informal, that is having many friends and contacts) would take vaccine at higher rates than would people who had little social interaction.

Table 11: Vaccine Acceptance by Social Participation and Social Class (% Takers)

Social Class	Social Participation				Total
	High	Medium	Low	None	
I & II	91	79	69	-	75
III	- *	83	73	57	72
IV	-	63	62	43	56
V	-	55	58	20	39
Total	78	73	66	42	61

Soc. Class + Soc Part. Independent

*Cells with less than 10 respondents have not been percentaged.

Question 4: Is social participation associated with vaccine acceptance?

Question 5: Does degree of social participation explain the relationship of social class status to vaccine acceptance?

Question 6: What are the major attributes associated with non-vaccine acceptance?

Question 7: Based upon these data, what recommendations would you make in designing a new program to increase the rate of vaccine acceptance in those "hard to reach" people?

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FACULTY GUIDE

Question 1: Selective recall. People who have accepted the vaccine likely to respond differently to questions concerning knowledge and fears of polio than before they had accepted the vaccine. (This phenomenon tested is a subsequent study where respondents were interviewed before and after the program and found to influence the magnitude of the associations but not the direction.)

Question 2: Review dummy tables with students.

Question 3: (1) The association of educational level and vaccine acceptance not a function of knowledge. The better educated respond at a higher rate at equivalent levels of knowledge - no matter how knowledge measured (knowledge of vaccine, of availability or of causes of polio), i.e., educational level presumably indicating some process other than knowledge, possibly group membership.

(2) Some interesting examples of interaction.

Table 7: Knowledge of availability associated with acceptance at all educational levels except lowest.

Table 8: Knowledge of causes of polio only associated with acceptance in the better educated.

Table 9: Personal worry about polio not associated with acceptance in the better educated, but associated in the less well educated.

Question 4: Influence of social participation. Yes: 78% 73% 66% 42%.

Question 5: No: Social class and social participation have effects of acceptance independently of each other.

Question 6: Low social class (poor education), non social participators absence of any personal worry about polio.

Question 7: In such, people increasing the knowledge about the program or the vaccine or the disease unlikely to have much effect. One approach used in a subsequent study* was based upon attempts to increase social interaction by using a community organization approach geared to encouraging local participation (in "hard Core" areas) in the vaccine program. For this purpose "hard core" areas were identified prior to the program and in one

* Chapters 2 (Promotional Procedures and Health Education Aspects by Elizabeth Reed) and 4 (Factors Influencing Vaccine Acceptance by Northcutt, Jenkins and Johnson) of the Hillsboro County Oral Polio Vaccine Program, James Neil and James Bond (eds.), Florida State Board of Health Monograph No. 6.

(comprising 14 neighborhoods) a special community organization for health education program ~~for health education~~ was initiated. The other hard core neighborhoods received the same program as did the rest of the city.

	% Takers	<i>Salk</i>	<i>of Take</i>
"Hard core" areas receiving special program	37	20	
"Hard core" areas without special program	64	35	
Areas usually responding well to health programs	74	65	