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ABSTRACT: A study made in 1966 in Butte County, Calif., to assess the effectiveness of fire hazard inspection procedures was repeated in 1967. Purpose of the inspections is to secure compliance with fire safety requirements. The observed drop in number of violations suggests a carryover effect in 1967 from the first study. In many cases, personal contact was still necessary to secure conformance—despite exposure to the program in 1966; in some cases, more than one contact proved to be necessary.

RETRIEVAL TERMS: fire prevention; fire hazard inspection; fire law violation; fire prevention education; forest fire prevention; forest fire risk; Butte County; California.

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Follow-Up Evaluation of Fire Hazard Inspection Procedures

. . . Butte County, California

WILLIAM S. FOLKMAN

In 1966, the Pacific Southwest Station and the California Division of Forestry joined forces to study the procedures used by the Division in inspecting for fire hazards around residences in high-risk areas. A sample of residences in Butte County, Calif., was selected for the evaluation.[1] Inspectors checked for violations of the State's Public Resources Code. An analysis of their reports showed a number of items of significance to administrators of this protection activity. To substantiate the findings and to determine the effect of the carryover of experience from one year to the next, the study was repeated in 1967.[2]

The additional year's experience with evaluated fire hazard inspections verified the major results of the 1966 study. Carryover effect from that year was considerable. It helped reduce significantly the number of violations in 1967. This finding was most evident in the compliance with incinerator standards and with requirements for burning permits.

Procedure

The procedure established for the 1966 study was followed as closely as possible. One slight modification involved reversing the portions to receive advance notice in two of the study areas. We wanted to see if this change would result in any observable difference in the rate of compliance. (As it turned out, we could not detect any difference.) Experience from the 1966 study had suggested an earlier starting date for the new study. For ease of compliance, encouragement to clear about structures should be made before the ground becomes hard and dry.

However, spring arrived late in 1967. Consequently, the calendar schedule of the two studies was quite similar. The time schedule for the follow-up study was as follows:

April 17, 18, 1967: Letters giving advance notice of fire hazard inspection were sent to one-half of the residents in each study area.

May 15 to June 14: Residents in all areas received their first inspection. Control segments in each area were not included.

Inspection plus 1 to 2 days: Follow-up letters to one-half of violators were sent.

Inspection plus 10 days: One-half of the violators received a follow-up inspection.

June 16 to July 22: Final inspection and inspection of control segments were made.

Twelve additional properties were identified in the study areas in 1967, making the total 1,065.

Results

The people contacted in 1967 again responded well to the inspections and the inspectors. In a few isolated instances--especially on the fringe of the study areas--the property owners had become aware that some people in the community had not been inspected, and they questioned this disparity.

The inspectors found that only one-fourth of the properties had violated some section of Public Resources Code at the time of the initial inspection. However, an additional one-fourth, although not technically in violation at the time, had grass growing next to structures. Grass next to a building when dry would place the property-owner in violation of the code. This finding amounted to 49 percent of all properties requiring reinspection in 1967, in contrast to 63 percent in 1966--a decline of 14 percent.

In all but two instances, there were declines over the earlier study after each variation of inspection procedure. After the final inspections the overall rate of violation was reduced to 12 percent--a decline of 5 percent from 1966 (fig. 1).

The lack of homogeneity between, and within, the study areas produced some difficulties in assessing the effects of the different treatments. It has the effect, however, of pointing up the importance in an operational program of recognizing several factors. They include the effects on the number of violations of physical characteristics, the nature of development, and the characteristics of the people living there. Still other factors include the varying ease or difficulty of rectifying violations on different properties, and the general attitudes of the residents.

Again, in 1967, it was not possible to confine the effects of the experimental variables to the areas within which they were applied. Had it been possible to do so, the apparent effects of various treatments would have been maximized. This "spillover" effect has the result of masking differences between experimental and non-experimental areas.

Types of Violations

The inspectors received the same instructions as those given in the earlier study. They were to check particularly for violations of Public Resources Code Section 4291 (reduction of fire hazards around buildings), PRC 4423 (written permit required for burning), and PRC 4446 (incinerator standards). If they observed other violations of the Code, they were to note them, but they were to emphasize violation of these three code sections.

In the repeat study, the inspectors recorded 752 separate violations. Violation of the clearance requirements was again the most frequent infraction. It accounted for 90 percent of the violations in 1967, in contrast to 79

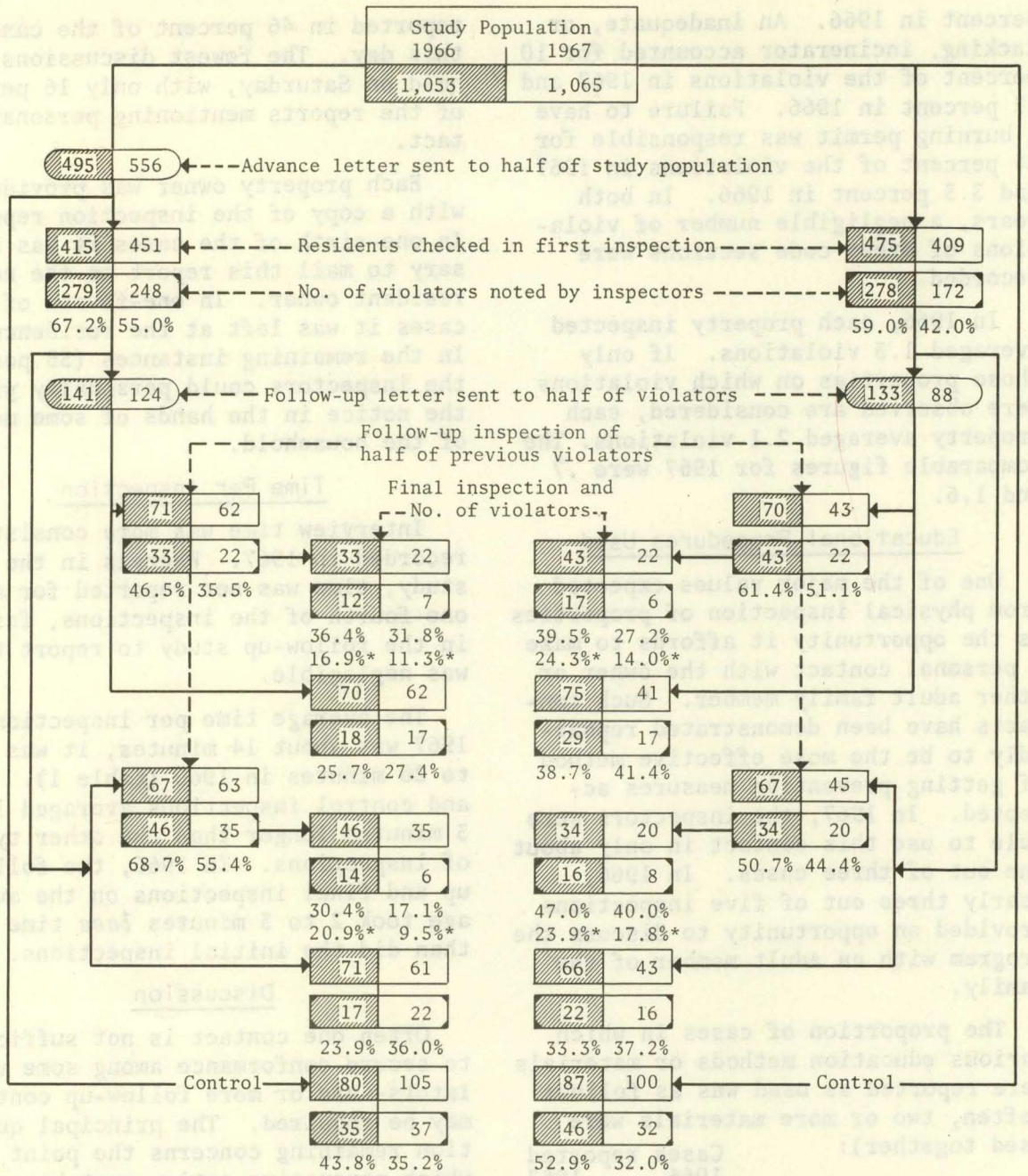

Figure 1.--Summary of study plan and results. Within each block, the figures show the number of properties that received a particular treatment; figure to the left represents 1966 result; that on the right, 1967 result. Percentage figures below the block show the proportion of violations at that stage of the study. Percents asterisked are derived from Pre-Follow-Up Inspection base (see chart) to make them comparable to adjacent percentages.

percent in 1966. An inadequate, or lacking, incinerator accounted for 10 percent of the violations in 1967 and 17 percent in 1966. Failure to have a burning permit was responsible for 0.4 percent of the violations in 1967 and 3.5 percent in 1966. In both years, a negligible number of violations of other code sections were recorded.

In 1966, each property inspected averaged 1.3 violations. If only those properties on which violations were observed are considered, each property averaged 2.1 violations. The comparable figures for 1967 were .7 and 1.6.

Educational Procedures Used

One of the major values expected from physical inspection of properties is the opportunity it affords to make a personal contact with the owner or other adult family member. Such contacts have been demonstrated repeatedly to be the mose effective method of getting preventive measures accepted. In 1967, the inspectors were able to use this contact in only about one out of three cases. In 1966, nearly three out of five inspections provided an opportunity to discuss the program with an adult member of the family.

The proportion of cases in which various education methods or materials were reported as used was as follows (often, two or more materials were used together):

	Cases reported	
	1966	1967
	(percent)	
Method used:		
Discussion	59	36
Literature	47	2
Letter	31	30
Notice only	2	29
None reported	16	6

A number of inspections were made on Sunday this year. This turned out to be a particularly good day to make contact with people. Discussion was reported in 46 percent of the cases on this day. The fewest discussions were held on Saturday, with only 16 percent of the reports mentioning personal contact.

Each property owner was provided with a copy of the inspection report. In one-sixth of the cases it was necessary to mail this report to the nonresident owner. In one-fourth of the cases it was left at the residence. In the remaining instances (58 percent) the inspectors could personally place the notice in the hands of some member of the household.

Time Per Inspection

Interview time was more consistently recorded in 1967. Whereas in the 1966 study, time was not reported for about one-fourth of the inspections, failure in the follow-up study to report time was negligible.

The average time per inspection in 1967 was about 14 minutes, it was 15 to 20 minutes in 1966 (table 1). Final and control inspections averaged 1 to 3 minutes longer than the other types of inspections. In 1966, the follow-up and final inspections on the average took 2 to 3 minutes *less* time than did the initial inspections.

Discussion

Often one contact is not sufficient to secure conformance among some violators--one or more follow-up contacts may be required. The principal question remaining concerns the point at which persuasive action must be replaced by more forceful measures. This decision involves not only economic considerations in the operational administration of the program (repeated call-backs are expensive) but also the over-all consequences of the coercive aspects of enforcement.

More inspections were made on weekends in 1967. Sunday proved to be a particularly good day to make contact with people, but the record for Saturday was worse than any other day.

Table 1.--*Distribution of inspections, by time required for inspection and by type of inspection, Butte County, California, 1967*

Time required (minutes)	Initial inspection	Follow-up inspection	Final inspection (no follow-up)	Final inspection (after follow-up)	Control	Total
	Percent					
(1/)	0.6	0.9	0.5	--	--	0.5
< 10	38.2	40.8	31.9	8.1	35.1	35.5
10-14	36.0	30.5	32.3	46.5	18.0	33.1
15-29	21.2	25.4	34.3	45.4	42.5	27.8
30-44	3.4	2.4	1.0	--	4.4	2.8
45-59	.4	--	--	--	--	.2
> 59	.2	--	--	--	--	.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

[1]Not reported.

Travel time between inspections accounts for a significant portion of the inspectors' time. In 1967, they averaged a little more than 9 minutes in traveling from one property to the next. In 1966 their travel time was not recorded.

The general population in the study areas has become much better informed of the provisions of the Public Resources Code through the inspection program. However, this knowledge alone is not sufficient to produce action leading to compliance. Most property owners seem to require the additional incentive of a contact by agency personnel before they do comply.

The effectiveness of the inspection effort might be improved if inspectors are kept acutely aware of the significance of an educational personal contact to the success of a fire prevention program. The organization having invested the time and personnel to put an inspector on the premises, it would be false economy for him to slight this opportunity for a personal contact so as to squeeze in a few extra inspections during the day.

FOOTNOTES

[1]Folkman, William S. *Evaluation of fire hazard inspection procedures in Butte County California.* U.S. Forest Serv. Res. Note PSW-145, 10 pp., illus. Pacific SW. Forest & Range Exp. Sta., Berkeley, Calif. 1967.

[2]The study reported in this note was made in cooperation with the California Division of Forestry.

The Author

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