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Sara Schneiders MS , Kelley Donham DVM, MS , Peter Hilsenrath PhD , Natalie Roy MPH & Kendall Thu PhD

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REVIEWS, CASE HISTORIES, AND RESEARCH

Certified Safe Farm: Using Health Insurance Incentives to Promote Agricultural Safety and Health

Sara Schneiders, MS
Kelley Donham, DVM, MS
Peter Hilsenrath, PhD
Natalie Roy, MPH
Kendall Thu, PhD

ABSTRACT. Data is presented on the health insurance coverage of approximately 260 farmers in Northwest Iowa. A combination of telephone interview and self-administered questionnaire was used to collect information on health insurance premiums, coinsurance rates, and deduct-

Sara Schneiders is Project Coordinator, Certified Safe Farm Project, and Kelley Donham is Professor of Occupational and Environmental Health and Director of Iowa's Center for Agricultural Safety & Health (I-CASH), University of Iowa, Iowa City, IA. Peter Hilsenrath is Associate Professor and Acting Department Chair of Health Management and Policy, University of North Texas Health Science Center, Fort Worth, TX. Natalie Roy is Consultant, Certified Safe Farm Project, Myersville, MD. Kendall Thu is Assistant Professor of Anthropology, Northern Illinois University, DeKalb, IL, and former Associate Director of Iowa's Center for Agricultural Safety and Health (I-CASH), University of Iowa, Iowa City, IA.

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ibles. Data was also collected on the injury and illness experiences of the subjects. Thirty-nine percent (100) of primary farm operators and 63.5% (154) of spouses worked off the farm. Of those who worked off-farm, 30 primary operators (30%) had coverage through their off-farm employer, and 41 spouses (27%) received health insurance through their off-farm employer. In addition to a general description of demographics and insurance coverage, the following research questions were investigated:

1. Are farmers with high cost coverage less likely to seek health care when they have illnesses and injuries than are farmers who have low cost insurance coverage?
2. Do farmers with off farm employer coverage have lower insurance costs than farmers who have individual coverage?

No conclusive evidence supported a relationship between the cost of coverage and the number of health care visits. However, persons with off-farm employer sponsored coverage had significantly lower premiums than those without off-farm coverage. Additionally, those with family coverage from an off-farm employer had significantly lower deductibles. Implications for use of health insurance premium reductions as an incentive for safe farms are also discussed.

KEYWORDS. Agriculture, health insurance, incentive, premium, coinsurance, deductible

INTRODUCTION

Murphy[1] has concluded that traditional, information-based approaches to risk reduction have had little or no influence in changing the occurrence of occupational illnesses and injuries. However, interventions that include multiple factors, such as financial incentives for behavior change and hazard elimination may have a better chance of improving health and safety. One intervention study, the Certified Safe Farm Project (CSF),[2] has targeted four areas of agricultural health intervention to combat injuries and illnesses related to agriculture. These four areas include: hazard removal through a yearly farm review, health promotion and monitoring through yearly health screenings, individually tailored

health education and personal protective equipment education, and monetary incentive payments.

The Certified Safe Farm Project is a prospective study that currently includes 280 farmers in Northwest Iowa. Subjects were recruited from a nine-county area in Northwest Iowa through an initial mailing, which included a return postcard for those interested in learning more about the project. A follow-up telephone call was made to those who expressed interest, and eligibility was based on two criteria: the farmer planned to sell $1,000 in agricultural products in one year's time, and he/she planned to continue farming for the duration of the study. Following recruitment, subjects were randomly selected into a control or intervention group. One hundred forty farmers receive the intervention. These farmers undergo a yearly health screening and receive education tailored to specific occupational hazards associated with their farm operation. They also receive a yearly farm safety audit in which a specially trained auditor makes a visit to the farm and checks machinery, buildings, and the surrounding environment in order to identify and aid in the elimination of on-farm hazards. If the intervention farmer becomes "certified," that is, passes the safety audit with 85% overall score for all checked items, then his/her farm is designated as a "certified safe farm" and the farmer receives $200 for the time and materials invested in making safety improvements. This financial award is intended to offset some of the costs associated with making farm improvements. The 140 farmers in the control group do not receive the health screening, health education, or farm safety audit. However, both groups are asked to keep a detailed record of illnesses and injuries that occur on the farm, respond to telephone calls regarding those occurrences, and fill out an Occupational Health History Form each year of the study.

The primary goals of the Certified Safe Farm Project include the following: to detect a noticeable reduction in illnesses and injuries in the intervention farmers who are certified in comparison to control farmers and to encourage insurance companies to make an investment in certified farmers. Health insurance companies may make an investment in certified farmers by subsidizing a portion of their premium costs. Because certified safe farms may have reduced occupational risk compared to non-certified and control farms, the insurers who subsidize certified safe farms will foresee a decrease in health insurance claims submissions by these farmers.

Health insurance discounts would provide the incentive for farmers to join the Certified Safe Farm Project once the research phase is com-

pleted. Because of this, it is necessary to obtain a profile of the insurance carried by farmers in order to see what implications there might be for this type of incentive-based program.

METHODS

The present study of health insurance coverage is a nested study within the Certified Safe Farm (CSF) community intervention program. All CSF control and intervention farmers were included in this research on health insurance coverage. Data used in analysis included responses to 10 specific health insurance questions from the Occupational Health History Form that was administered to all CSF subjects in 1998, along with an additional telephone interview regarding off-farm coverage. No information on worker's compensation coverage, property/casualty coverage, crop insurance, disability insurance, or other insurance types was included in this study. Due to missing data, the total number of subjects in the nested study on health insurance coverage was 256, somewhat lower than the total number of CSF farmers enrolled in the program (280).

Two major hypotheses were investigated: (1) Uninsured farmers or farmers with high cost health insurance coverage are less likely to seek health care services, compared to farmers who have low cost health insurance. (2) Farmers who have high cost health insurance are more likely to have private coverage that does not come from an off-farm employer, while farmers who have low cost health insurance coverage are more likely to have group plan insurance coverage through an off-farm employer.

Through information found in the literature sources[3-5] and through personal communication with an expert in the field,[6] premiums, co-insurance, and deductibles were categorized as low cost, high cost, or average cost according to the values defined in Table 1. Coverage was also categorized depending on whether the primary operator was the only person covered under the plan (single), or whether the primary operator and additional family members were covered (family).

Once the categories were defined for each variable, as outlined above, the three variables (A or B, C, and D or E) were combined to create four overall categories of health insurance coverage (low cost, average cost, high cost, or uninsured) for the principal operator and any other persons covered under that plan. Each primary operator was

placed in one of the four categories based on this designation. The four categories are defined as shown in Table 2.

The designation of coverage outlined in Table 2 was an arbitrary categorization based upon out-of-pocket expenses for health care coverage. The assumption was made that high premiums or high deductibles alone can determine if coverage is in the high cost category. For example, one farmer might have a high deductible, but low premiums and co-insurance rates. Although only one of the three is high cost, the farmer with a high deductible has to pay for health care out-of-pocket, until the deductible is met. On the same token, a farmer with high cost premiums, but a low deductible and co-insurance rate has to pay a substantial amount of money on a monthly basis in order to receive basic health care coverage. Both of the above scenarios require extensive out-of-pocket expenditures before the health insurance company pays for services. This problem was alluded to when several farmers mentioned that they chose to increase their yearly deductible in order to keep their premiums at a stable cost, or to minimize the rate of increase in their premiums.

TABLE 1. Designation of Health Insurance Premiums, Co-Insurance, and Deductibles as High Cost, Low Cost, or Average Cost

A. Annual premium (single)	B. Annual premium (family)	C. Co-Insurance	D. Deductible (single)	E. Deductible (family)
Low < or = to $2000	Low < or = to $4600	Low <20%	Low < $200	Low < $400
Average $2001-$2300	Average $4601-$5290	Average 20%-29%	Average $200-$300	Average $400-$600
High > or = to $2301	High > or = to $5291	High > or = to 30%	High > $300	High >$600

TABLE 2. Designation of Health Insurance Costs as Low, High, or Average, Based Upon the Ratings of Premiums, Co-Insurance, and Deductibles

Low	**Average**	**High**	**Uninsured**
To be in the low category, at least one (A or B, C, D or E) must fall into the low category, and NONE can be high	To be in the average category, all listed (A or B, C, D or E) must be average	To be in the high category, there can be any combination, as long as one (A or B, C, D or E) is high	To be in the uninsured category, the person must have noted that all health care services were paid for *only* out-of-pocket

Data analysis was of a descriptive nature, using frequency testing, chi-square tests, correlation, and non-parametric tests. Tests of central tendency, such as mean, median, and mode were also used.

RESULTS

Private health insurance coverage was the primary form of health insurance coverage in this population. Private health insurance coverage included coverage that was purchased by the principal operator himself, or through his own or his spouse's off-farm employer. Table 3 shows this breakdown by type of coverage. All persons were allowed to list up to three forms of coverage, therefore the total number of respondents is greater than the total number of persons surveyed.

One hundred seventy-six households had coverage under one plan for all persons in the household (68.8%). Fifty households had partial family coverage (19.5%). Partial coverage indicated that some, but not all members of the household were covered under the listed insurer. Persons in the household not covered by the insurer of the primary operator were either covered under another policy or company, or were uninsured. In addition, 18 households had policies where some persons covered under the plan were not living at that address (7.0%). This included coverage of college-age children who were not living at home. The remaining 12 households did not indicate who was covered under the insurer. These results are found in Figure 1.

One hundred, or 39%, of the primary farm operators noted that they were employed in an off-farm occupation. Thirty-nine of these worked

TABLE 3. Payment Methods for Medical Care

Form of payment	Frequency	Percent of total n
Private pay (out-of-pocket payment)	135	52.7%
Private health insurance (purchased by self and/or employer)	227	88.7%
Medicare	32	12.5%
Medicaid	2	.8%
Government (exclusive of Medicare and Medicaid)	4	1.6%

Frequencies are greater than the total number of subjects due to multiple responses for each person. Percents are also >100% due to multiple responses.

at least 35 hours per week off the farm for 35 or more weeks during the year. Sixty-one persons worked off-farm less than 35 hours per week and less than 35 weeks per year (see Figure 2).

Of the 256 principal operators, 242 were married. One hundred fifty-four spouses, or 63%, worked off-farm for part or all of the year. Twenty-four (10%) spouses worked off-farm 40 or more hours per week for a full 52 weeks per year. Forty-nine spouses (20%) worked at least 35 hours per week for at least 36 weeks per year. The remaining 81 spouses (33%) worked less than 35 hours per week for less than 36 weeks per year (see Figure 3).

Regarding where the farmers received their health insurance, 71 (28%) of the 256 study participants received health insurance coverage through an off-farm employer. Thirty (12%) received this coverage through their own off-farm employer, while 41 (16%) received this cov-

FIGURE 1. Family Members Covered Under the Same Policy as the Primary Operator

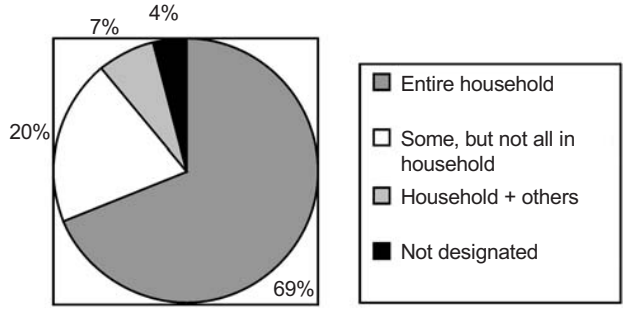
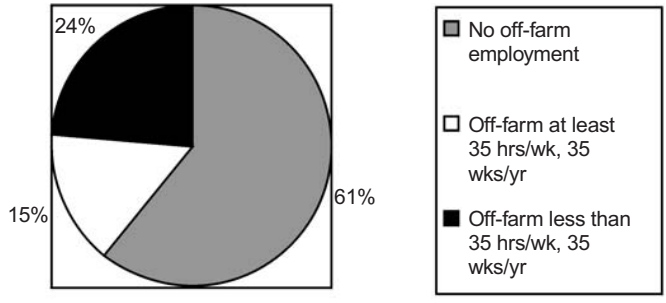


FIGURE 2. Employment Status of Primary Farm Operator



erage from their spouse's off-farm employer. One hundred eighty-one primary operators (71%) had coverage from another source. Those included in this category were persons with private coverage not provided through an off-farm employer (n = 143), those with Medicare (n = 32) and Medicaid (n = 2) and those with Government coverage (n = 4). Four people (1.6%) were uninsured, paying for health care solely out-of-pocket (see Figure 4).

Significant differences were found in premiums, co-insurance, and deductibles between persons with and without off-farm employer coverage. Single person policyholders with off-farm employer coverage had lower premium costs than single person policyholders without this type of coverage (p-value = .0001). Also, premiums for families with off-farm employer coverage were significantly less than premiums for

FIGURE 3. Employment Status of Spouses

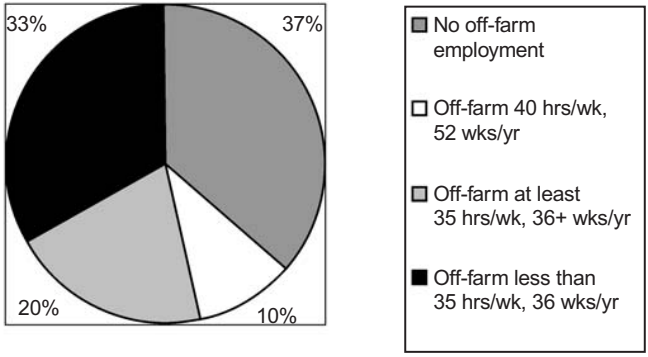
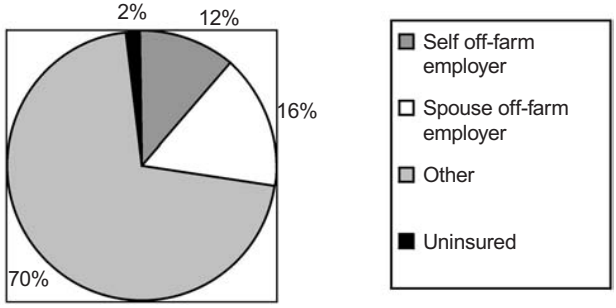


FIGURE 4. Source of Health Insurance Coverage



families without off-farm employer-sponsored coverage (p-value = .0001). Co-insurance rates and deductibles were also significantly different between the two groups. Families without off-farm employer coverage had lower co-insurance rates, but higher deductibles than families with off-farm employer coverage (p-value = .004 and .0001, respectively). This information is shown in Table 4.

Graph 1 further illustrates the difference in average premiums and deductibles between families with and without off-farm health insurance coverage.

Table 5 illustrates the results of categorizing each person's health insurance coverage as uninsured, high, low, or average, as designated using the parameters previously mentioned.

When looking at premiums, co-insurance rates, and deductibles separately to determine which of the three variables was most likely to con-

TABLE 4. Premiums, Co-Insurance, and Deductibles for Persons With and Without Off-Farm Employer Sponsored Health Insurance Coverage

	All single	Single with off farm coverage	Single without off farm coverage	All family	Family with off farm coverage	Family without off farm coverage
Total n	44	8	36	199	62	137
Average premium	$1663.32	$577.33	$1844.32	$3091.64	$1962.09	$3569.54
Average co-insurance	16.2%	7.5%	17.3%	17.4%	21.6%	15.6%
Average deductible	$881.58	$1290.00	$819.70	$1173.63	$411.90	$1514.23

GRAPH 1. Family Premiums and Deductibles Based on Source of Coverage

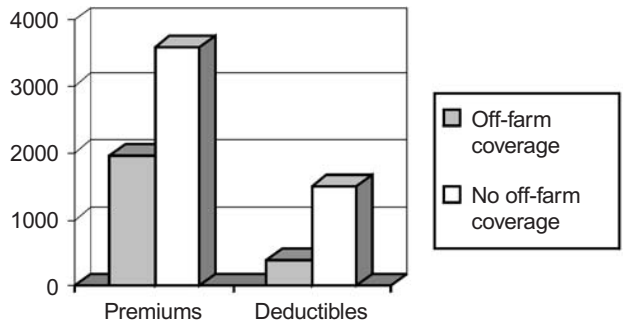


TABLE 5. Percent of Study Population in Each of Four Categorizations of Health Insurance Coverage

Category	N obs	Percent total
Uninsured	4	1.6%
High	141	57.6%
Low	98	40.0%
Average	2	.8%

tribute to high cost health insurance coverage, 130 persons with high cost coverage had high deductibles (53.1%), 15 had high co-insurance (6.1%), and 32 persons had high premiums (13.1%). Thirty-six people (25.5%) with high cost coverage had more than one variable in the high category (i.e., premium and deductible).

One hundred fifty-six persons (61%) noted that they were very satisfied or satisfied with their coverage. Sixty-six persons (26%) recorded that they were somewhat satisfied with their insurance coverage, and 27 persons (10.5%) said that they were dissatisfied or very dissatisfied with their coverage. Seven people (3%) did not respond to this question.

When asked if they or a family member had not sought care in the past 12 months because of inadequate insurance coverage, 23 of 251 respondents said yes to this question (9.2%). Seventeen of the twenty-three persons who said yes to this question had high cost deductibles.

When excluding persons with public coverage (includes Medicaid, Medicare, or Government coverage), 50 of 69 (73%) persons with low cost insurance coverage had off-farm employer coverage, while only 16 of 136 (12%) persons with high cost health insurance coverage had off-farm employer coverage. Using chi-square test, the proportions were significantly different at a p-value of .001. No significant difference was found in the frequency of health care visits between uninsured or high cost coverage persons and low cost coverage persons. Table 6 shows the number of doctor visits for persons in each categorization of coverage in the 12 months prior to filling out the Occupational Health History Form.

These results indicate that even though 130 farmers had high deductibles, this limit on coverage did not prevent the farmers from seeking coverage when deemed necessary. Additionally, although 57% of the study subjects had high cost health insurance coverage, only 11% of all subjects stated that they were dissatisfied with their coverage.

TABLE 6. Number of Doctor Visits for Persons in the Four Categories of Health Insurance Coverage

Category	N obs	N	Mean # doctor visits	Minimum # doctor visits	Maximum # doctor visits
Uninsured	4	4	1.25	0	4
High cost	141	128	2.27	0	25
Avg. cost	2	2	6	0	12
Low cost	98	86	2.9	0	20

DISCUSSION

The incentive behind farmer participation in the Certified Safe Farm Project is based upon the willingness of insurers to subsidize a portion of health insurance premiums that certified farmers pay for coverage each year. The possible benefits of certification are as follows: the farmer lives and works on a safer farm, has fewer health insurance claims and pays less for health insurance premiums, while the insurer invests in farmers who are at lower risk of occupational illnesses and injuries. This same scenario could be applicable to several other forms of insurance purchased by farmers, including: disability, property/casualty, and worker's compensation.

Several considerations must be addressed before the current monetary incentive can be replaced by the insurance premium subsidization that may occur when the Certified Safe Farm Project is implemented on a national scale.

Seventy-one, or approximately 28%, of the primary operators received their health insurance coverage through their own or their spouse's off-farm employer. Because farmers today are increasingly working off the farm in order to make ends meet,[7] the self-employed farmer with no other source of income is becoming less common. Almost one in three CSF families had coverage through a group plan from an off-farm source. Ideally, subsidization for certified safe farms would be provided by all health insurance companies, and would include farmers who work off-farm along with those farmers who are solely self-employed. However, if one competitive health insurance company took the lead in providing lower cost health insurance coverage to certified safe farmers, the insurer could potentially secure a huge market share of the farming population, of whom many are in search of more affordable health care.

Because farmers and their spouses may be more likely than other populations to be employed off-farm at small rural businesses that are unlikely to provide health insurance coverage for full-time workers,[8] further research should look more closely at the employment trends of this population, and how their employment affects availability of affordable health care coverage. This will become even more relevant as the number of farmers who are forced to find supplemental income off-farm increases.

The Certified Safe Farm Project has the potential to improve the farm safety habits of agricultural workers throughout the United States. Farmers who make the effort to decrease their occupational health risks could be rewarded with a reduction in health insurance premium costs. This is an appropriate incentive to use in encouraging health and safety because health insurance expenses are a prevalent concern in this population. This project also has the potential to modify the health insurance industry through an increased awareness surrounding the benefits of agriculturally-related risk factor prevention and its association with improved health and safety.

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