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T. S. Prince MD, MSPH & Susan Westneat MA

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Perceptions and Behaviors of Primary Care Physicians Regarding Farmers' Occupational Exposures and Health

T. S. Prince, MD, MSPH
Susan Westneat, MA

ABSTRACT. Background: Agricultural work remains one of the most hazardous occupations in terms of injury and illnesses. It is not well known, however, to what extent physicians who care for farmers are aware of these risks, or if they perform additional medical surveillance or counseling specifically for their farming patients.

Methods: At a series of recent medical conferences, 209 physicians completed questionnaires concerning farm health issues and personal medical practice behaviors.

Results: Given a series of diseases known to be associated with farming and asked to compare prevalence rates between their farming patients and their other working patients, the respondents rated only skin diseases as being more prevalent among farmers. Risk perception increased with personal farm experience and number of farming patients seen.

Conclusions: Some primary care physicians, particularly those with a limited knowledge of farming as an occupation, may underestimate the health risks associated with agricultural exposures. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-342-9678. E-mail address: <getinfo@haworthpressinc.com> Website: <http://www.HaworthPress.com>*

T. S. Prince and Susan Westneat are affiliated with the University of Kentucky's Southeastern Center for Agricultural Health and Safety.

Address correspondence to: Dr. T. S. Prince, Southeastern Center for Agricultural Health and Safety, 1141 Red Mile Road, Suite 102, Lexington, KY 40504-9842.

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BACKGROUND

Farming has consistently been one the most hazardous occupations in terms of injury and illness.[1] The rate of occupational injury fatalities for farm workers in 1994-1995 was approximately six times higher than the national average for all workers, and has been consistently and significantly higher for at least the past two decades.[2,3] Farm related nonfatal injury rates have also remained among the highest reported for any occupation.[1,4] Tractor roll-overs, farm machinery entrapment or crush injuries, trauma from large animals, and falls are common causes of injuries, and many of these injuries result in significant morbidity and mortality.[4]

Agricultural exposures are also associated with increased risks for a variety of illnesses.[1] Pesticide intoxication and green-tobacco illness represent typical acute conditions that are easily recognized as being related to farming.[4,5] Several subacute and chronic diseases, including reactive respiratory conditions such as silo-fillers' lung, are caused by occupational exposure on the farm. Recently, concern has increased about unique or increased exposures associated with large-scale farming methods, particularly swine containment facilities.[4,6] In addition, certain common diseases in the general population are more frequent in farmers as a direct result of their work. These include hearing loss, osteoarthritis of the hip, and skin cancer.[1,7] Finally, secondary factors, not directly related to work exposures, affect the health of the farm family. These include rural healthcare access issues, the availability of adequate health insurance for farm families, and the stress of farm work in the changing agricultural economy.[8,9]

Despite the existing clinical and epidemiologic data demonstrating specific health risks associated with agriculture, there is limited scientific literature regarding the extent to which practicing physicians are aware of these risks and/or modify their medical practice behaviors specifically for their farming patients.[10] This study describes a group of primary care physicians' perceptions regarding specific health risks for their patients who farm, and whether the physicians provide additional counseling or disease screening for their farming patients. It examines factors that may increase familiarity with the farming environment, and how these influence perceptions of risk and clinical practice behaviors.

MATERIALS AND METHODS

Three times each year the University of Kentucky hosts a one-week family practice review course, which is typically attended by 75-200 physician participants from around the country. The questionnaire designed for this study asked participants' specialty and characterized certain demographic aspects of their clinical practice. It also addressed the physicians' own farm experience, if any, and grouped this by type: currently farming, previously farmed, or grew up on a farm.

Respondents were then given a list of disease categories and asked if their *farming* patients were at higher, lower, the same, or unknown risk compared to their *other working* patients. They were also asked if they added any counseling or screening for their farming or farm family patients based on exposures/risk. Another section asked if continuing medical education (CME) programs attended within the last three years had any content related to agricultural health issues.

Prior to distributing the survey at the first conference, several family practice and preventive medicine physicians and epidemiologists reviewed questions. The survey, which asked no personal identifying information, was limited to a single page (both sides) to encourage participation. It was distributed at all three 1998 courses (February, May, and November), prior to one of the lectures, with a brief explanation and request for participation. Collection boxes were placed at several locations in the meeting hall.

By the end of the three meetings, 209 questionnaires were collected. This represented 52% of the physicians registered to attend, but 64% of those that were present for the sessions (by head count) when the survey was distributed. There was no formal characterization of the non-participants, but several physicians (5-10 each session) volunteered that they did not participate because they did not see farmers in their practice, though no instructions were given regarding this when the forms were given out. Results were entered into a database and analysis was performed with the SAS software system.[11]

RESULTS

Of the 209 responses received, 152 (72.4%) came from family practitioners. The specialty distribution is shown in Table 1. Though the majority of responses came either from Kentucky (n = 40, 19%) or the adjacent states (TN, VA, OH, IL, IN, WV, MO; n = 84, 40%), there

TABLE 1. Physician Specialty Distribution

Specialty	Number	Percentage
Family Practice	152	73
General Practice	27	13
Internal Medicine	12	6
Emergency Medicine	9	4
Other	9	4

were also participants from 19 other states. No countries except the United States were represented. One hundred and ninety-five (93%) knew they had farmers or farm families in their patient population. This group makes up the basis for the rest of the analysis.

Table 2 shows the estimated frequencies of patient encounters involving farmers and farm families. The majority of those with farm-related diseases (FRDz), particularly involving hospitalizations and fatalities, were seen by a small percentage of the physicians who had large farm patient populations. However, the majority of respondents did report seeing one or more farming patients per day in their practice. The number of farmers seen with skin cancer in the past year averaged 8.3 cases.

Table 3 shows overall responses for impression of disease risks. More respondents rated risks as "higher" rather than "lower" for their farming patients, but many either felt that the risks were similar or did not know the relative risk. Of the conditions listed, only skin diseases were rated as being more prevalent in farmers by the majority (73%) of physicians surveyed.

Impressions of risk did change significantly (Table 4) when controlling for either personal farming experience or number of farming patients treated. Those physicians treating three or more farming patients per week were more likely to feel their farming patients were at additional risk. However, a majority (53%) felt that farmers were at a higher risk only for accidents not related to motor vehicles (non-MVA). Using a higher number of patients as a cut-off did not change this finding significantly (not shown), although the number for physicians seeing large

TABLE 2. Farm Patient Medical Practice Characteristics

Characteristic	N	Mean	StDev.	Range : 25th, 75th %
% of Patients Live on Farm	194	21	19	1-90 : 5, 30
% of Patients Work on Farm	189	19	18	1-90 : 5, 30
# of Farm Patients/Week	181	21	25	0-125 : 3, 25
# of Farm-Related Disease/Month	182	5.7	10.9	0-100 : 1, 6
# Hospitalized with FRDz* Past Year	174	1.6	3.5	0-25 : 0, 2
# of Farm-Related Fatalities Past Year	167	0.2	0.7	0-5 : 0,0 (Sum = 33)
# Children with FRDz/Month	180	2.4	5.3	0-45 : 0, 2
# Farmers with Skin Cancer Past Year	179	8.3	16	0-110 : 1, 10

*FRDz: Farm Related Disease (Illness and Injury)

TABLE 3. Perceptions of Disease Prevalence–Farmers vs. Other Working Patients

Condition	N	Higher (%)	Lower (%)	Same (%)	Unknown (%)
MVA	173	17	27	38	19
NonMVA*	174	46	11	23	20
Arthritis	173	44	8	31	17
Lung Disease	174	41	13	30	16
Skin Disease	174	73	5	10	12

*NonMVA: All accidents not involving motor vehicles

TABLE 4. Effect of Physician's Personal Farm Experience and Numbers of Farmers Seen on Perception of Disease Prevalence

Condition	N	Higher (%)	Other* (%)	p-value (chi-square)
MVA				
< 3 Farmers/week	38	8	92	
> 3 Farmers/week	124	20	80	.05
No Farming Experience	87	13	87	
(+) Farming Experience	85	21	79	NS[.12]
NonMVA				
< 3 Farmers/week	48	27	73	
> 3 Farmers/week	133	53	47	< .01
No Farming Experience	87	49	51	
(+) Farming Experience	86	45	55	NS
Arthritis				
< 3 Farmers/week	48	32	68	
> 3 Farmers/week	133	48	52	< .01
No Farming Experience	87	38	62	
(+) Farming Experience	85	53	47	< .05
Lung Disease				
< 3 Farmers/week	48	23	77	
> 3 Farmers/week	133	47	53	< .01
No Farming Experience	87	33	67	
(+) Farming Experience	86	52	48	.01

*Other: Includes answers of lower, same, and unknown

numbers (> 25) of farming patients per week was small (n = 45), and this limited our analysis. Similarly, no specific trend was noted by specialty type or practice size (not shown).

The majority of physicians who had any type of farm experience (Table 4) viewed farming as a risk factor for arthritis (53%) and lung disease (52%). These physicians also rated the risk of motor vehicle ac

cidents (MVA) higher among farmers (20% vs. 8%), although this difference did not achieve statistical significance. Interestingly, however, personal farm experience did not increase their perception of risk related to accidents not involving motor vehicles. No significant differences were noted when the specific types of physicians' personal farm experiences (current, previous as adult, previous as child) were analyzed separately (not shown).

In terms of counseling or additional screening, fewer than half the respondents (43%) reported any change in medical care behavior for their farming patients, though both number of farming patients seen and prior farm experience increased the percentages (Table 5). Of those that did provide additional counseling (n = 84), the majority did so at either farm-related illness/injury visits (61%) or routine (health maintenance type) examinations (71%), but not at other acute visits (40%). Physicians who did perform additional screening based on farm exposure (n = 68) primarily performed skin exams (91%), hearing tests (31%), and arthritis screening (30%). All other testing combined (including pesticide and pulmonary screening) was performed by only thirteen respondents. Specific types or frequency of the counseling and diagnostic testing was not determined.

TABLE 5. Physician Behaviors Regarding Farming Patients

Behavior	N	Yes (%)	No (%)	p-value (chi-square)
Additional Counseling				
< 3 Farmers/week	45	31	69	
> 3 Farmers/week	125	54	46	.01
No Personal Farming Experience	90	35	65	
(+) Personal Farming Experiences	90	59	41	< .01
Additional Screening				
< 3 Farmers/week	45	24	76	
> 3 Farmers/week	121	45	55	.01
No Personal Farming Experience	88	28	72	
(+) Personal Farming Experience	88	49	51	< .01

Only seven physicians (4%) had received continuing medical education in the previous three years that included any discussion of agricultural health topics. Six of these had received one hour of training, while one physician had three hours. All of the training was related to risk of traumatic injury, and not chemical, biological exposures or psycho-social stressors.

DISCUSSION

With the exception of skin diseases, the majority of physicians surveyed did not view agricultural work as a significant risk factor for the conditions surveyed. More did rate their farming patients as being at a higher versus a lower risk compared to their other working patients, but many felt the risks were similar or did not know. The perception of risk did increase with the number of farming patients seen and, with the exception of non-motor vehicle accidents, with the farming experience of the physician. All of the diseases examined in this study have been associated with an increased risk from agricultural work compared to other occupations in general, although in this study there was no control for the specific type of farming performed by patients, or for which other occupations the physicians used as their basis of comparison.

Various factors have been proposed that may possibly explain the lack of concurrence between the increased agriculturally related risks defined by epidemiological studies and the risks perceived by practicing physicians. Many occupational and environmental influences on disease are often not strongly emphasized in medical school curricula, residency training, or continuing education courses.[12,13] Studies have suggested that both in patient medical charts and published case reports often do not include occupational histories.[12,14]

These factors may be even more prominently related to the lack of recognition of the association between agricultural exposures and health.[15] Farmers themselves may not view their work as hazardous, and therefore may not express concern to their physician.[16] Several papers have addressed the relative lack of (and need for) emphasis on agricultural health issues in medical schools.[15,17]

Several medical schools, however, have recognized this need and established programs at various educational levels to address training issues.[18,19] In addition, various scientific, philanthropic, and governmental organizations, including the National Institutes of Occupational Safety and Health, the North American Agromedicine Consortium, and the W. K.

Kellogg foundation, sponsor a variety of efforts to increase awareness of (and prevention efforts for) agricultural risks. Recent surveys of rural health service providers identify and emphasize specific agricultural health topics about which physicians want more information, and indicate possible delivery mechanisms.[10,20]

In regards to this study, several factors (in addition to those discussed previously) impact the usefulness and interpretation of the data, either inherently as a function of study design or by the number and nature of the participants. The length of the survey instrument did not allow for additional practice details, such as length of time in practice, types of farming performed by those physicians with farm experience, or the number of full-time vs. part-time farmers in the practice. For motor vehicle accidents, there was not a choice between those related to occupational versus nonoccupational causes. There was a predominance of practitioners from states near Kentucky, and physicians in other parts of the country may have responded differently. Similarly, while the vast majority of participants at this conference are board-certified, practicing primary care physicians, there may be a selection bias toward certain attitudes in conference attendees versus the non-attending primary care physicians who treat farmers. It is difficult to assume, however, that knowledge of farming risk factors would be significantly increased among physicians who attend few CME offerings or are not board-certified.

Despite these limitations, this study supports the idea that additional medical education at various training levels may be valuable in increasing awareness of health risks related to agricultural work. In addition, it supports the need for more research to characterize the association between physician awareness, clinical practice behavior, and health outcomes in preventing and treating agriculturally related disease.

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