

Morbidity and risk factors of Finnish farmers

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The mortality and morbidity of farmers have usually been studied in conjunction with socioeconomic mortality and morbidity. When mortality has been evaluated, it has been high among farm workers, but lower than average among independent farmers (1-3). In France, the mortality of farm workers was about 30% higher, and that of independent farmers about 30% lower, than the mortality of the whole French population at the end of the 1970s (3). In the Nordic countries the number of farm workers is small when compared with the number of independent (family) farmers, and the differences in mortality are smaller.

The morbidity of farmers has not been studied as much as the mortality, mainly because morbidity can be studied only with a survey, while mortality data are more easily available. However, in the Nordic countries, the first morbidity surveys were done already in the early 1960s. According to the results, Finnish farmers had a higher morbidity than the whole economically active population. The level was similar to that of unskilled workers. In the other Nordic countries, the morbidity of farmers was as low as that of upper white-collar workers (4, 5). At the beginning of the 1970s the morbidity rates of Finnish farmers were twice as high as those of farmers in the other Nordic countries (4).

In the present study we have analyzed the mortality of farmers in 1979-1985 and the prevalence of self-reported chronic illnesses in 1991 and compared these findings with the corresponding figures of other socioeconomic groups in Finland. In addition we have studied the development of occupational diseases among farmers during 1986-1990. Finally we have analyzed the work conditions of Finnish farmers and work-related morbidity by cause.

Materials and methods

The mortality study was based on the Finnish Farm Register. Information about the owner, occupation of the owner, and size of the farm was taken from the 31 December 1978 farm register. Information concerning the type of farm was collected separately from

the 31 December 1977 farm register. However, since most farm owners are men, we obtained information only on male farmers in this manner. We then used the personal identification number of the farm owners to trace the female population living on the farms through the insurance register of the Farmers' Social Insurance Institution.

Data on all deaths in the period 1979-1985 (causes of death, etc) were obtained from the death certificate data recorded in the Finnish Register for Causes of Death (6).

For the occupational disease analysis, we used the Finnish Register of Occupational Diseases (7). Other work-related morbidity was analyzed by cause with the use of different kinds of material published earlier in Finland.

Self-reported chronic illnesses were studied through the use of computer-aided telephone interviews. The study group was all of the farmers in 14 municipalities in various parts of Finland. From this group a stratified sample was chosen by age; it included 1500 farmers. During November 1991, 921 of these farmers were interviewed. The reference population was a random sample of 3175 persons from all of Finland; of this number 2274 were interviewed. The farmers were contacted from the Kuopio Regional Institute of Occupational Health, and the reference population was partly contacted from Kuopio and partly from Helsinki. The interviews from Helsinki were made by the Central Statistical Office of Finland.

The work conditions of the farmers were evaluated with the use of the Farmers' Occupational Health Service Study (8).

Results

Mortality. The mortality of the male farmers was similar to that of the whole economically active population during the 1980s (table 1). Both cardiovascular mortality and cancer mortality were also similar to the corresponding values of the total population. The violence mortality of the farmers was lower, and the respiratory mortality was higher, than the Finnish average. The mortality of female farmers was lower than the mortality of the whole economically active population independent of the cause of death.

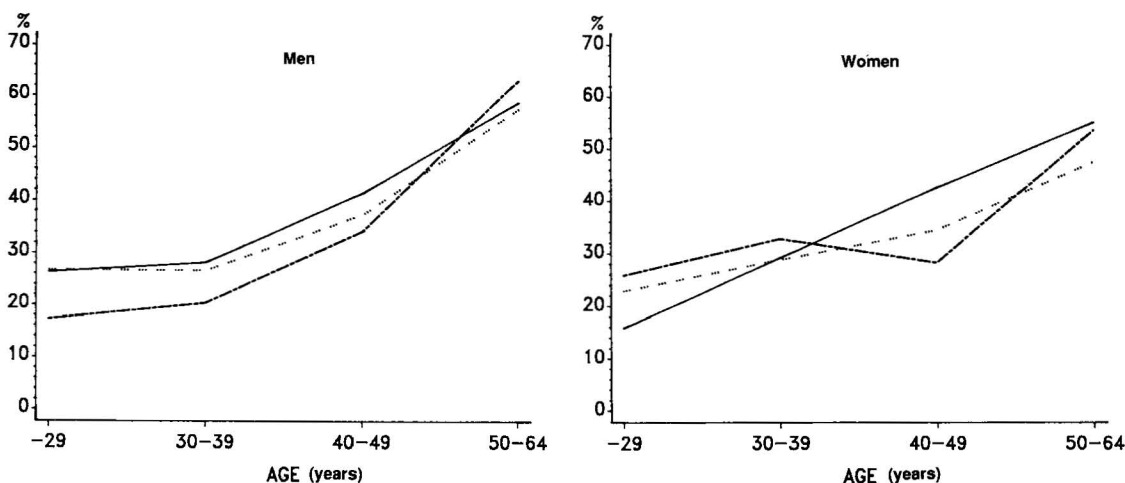
The mortality of the male farmers varied according to the size of the farm. It was highest among those farmers who owned small farms. There were also re-

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Table 1. Mortality by cause of death in 1979–1985 among farmers aged 35–64 years according to farm register data, with the data on the economically active population in Finland 1976–1980 as reference. (O = observed number of deaths, E = expected number of deaths, SMR = standardized mortality ratio, 95% CI = 95% confidence interval)

	Men				Women			
	O	E	SMR	95% CI	O	E	SMR	95% CI
All diseases	5972	5961	100	98–103	929	1449	64	60–68
Neoplasms	1619	1714	94	89–99	496	714	69	62–75
Cardiovascular diseases	3771	3694	102	99–105	350	412	84	75–92
Diseases of the respiratory system	247	158	156	137–175	14	28	50	24–76
Accidents, poisoning and violence	660	873	76	70–82	85	148	57	44–69
Total mortality	6632	6834	97	95–99	1014	1596	64	60–68

**Figure 1.** Prevalence of self-reported chronic illnesses among men and women by socioeconomic group and age in 1991. (— = farmers, - - - = white-collar workers, ··· = blue-collar workers)

gional differences in the mortality of farmers. Mortality was highest in the eastern and northern parts of Finland (6, 9). There were no mortality differences by type of farm.

Morbidity in general. The prevalence of self-reported chronic illnesses among the farmers was higher in 1991 than the prevalence of chronic illnesses among the white-collar workers (figure 1). There was no difference in morbidity among the younger age groups. Among those ≥ 40 years of age, both among the men and among the women, the morbidity of the farmers was higher.

Occupational diseases. In Finland farmers have received compensation for occupational diseases since 1982. The Finnish Register of Occupational Diseases shows an increasing tendency for agriculture and forestry from 1986 to 1990. The number of occupational diseases per 1000 employees was similar in agriculture

and in the manufacturing and construction industries in 1990 (ie, about 7.5 cases per 1000 employees).

According to the Finnish Register of Occupational Diseases repetitive movements ($N = 1539$), molds ($N = 1172$), and animal dander ($N = 951$) are the most common causes of occupational diseases in agriculture and forestry (table 2). Occupational diseases caused by repetitive movements generally involve the upper extremities (eg, epicondylitis, synovitis, tenosynovitis).

The incidence of registered occupational skin diseases among farmers has reached the same level as in the manufacturing industry. In recent years the registered cause of occupational skin diseases among farmers has been cow dander in about 25% of the cases. Other leading causes have been detergents, wet and dirty work, and rubber chemicals.

Occupational respiratory diseases caused by bioaerosols (organic and microbial dusts) represent the second largest group of occupational diseases reported for Finnish farmers in the last five years (table 3). If molds, animal dander, flour dusts, and other organic dusts are included, a total of 2244 cases of occupational respiratory diseases has been caused by bioaerosols. A growing number of cases of occupational

asthma and rhinitis has been caused by animal dander, cow dander being the most common cause. Other common causes are grain and flour dust. In Finland farmer's lung or allergic alveolitis has been very common. The incidence of farmer's lung has been decreasing because of the influence of occupational health services and extensive information campaigns. Still in 1990 there were 120 new cases of farmer's lung according to the Finnish Register of Occupational Diseases. Most Finnish farmers are involved in dairy farming, and therefore the prevention of these diseases is important.

Table 2 shows that the total number of occupational diseases increased in 1986–1990. However, we can assume that many cases of occupational diseases remain still unreported, partly because the coverage of occupational health services for full-time farmers is less than 50%. One might estimate that the figures in table 2 represent about 50% of the total number of true cases.

Work-related morbidity. According to the latest studies the one-year incidence of occupational accidents is about 15% for Finnish farmers. The incidence is highest among cattle farmers. In 1986 farming accidents caused an average loss of 24 workdays (15).

According to earlier studies farmers more often have mental disorders than those who work in other industries (16). In several studies during the 1980s the prevalence of mental disorders among farmers was high (16, 17).

The majority of farmers have different kinds of musculoskeletal symptoms. The one-year prevalence of back pain, for example, has been shown to be 45–80%, depending on the type of farming, age, and gender (18). In a recent experiment involving occupational health care for farmers, farmers suffered the most often from musculoskeletal disorders (8).

In 1979 the one-year prevalence of hand dermatoses was 7% among the men and 16% among the women. In a seven-year follow-up (from 1979 to 1986) the prevalence declined, except among those who milked cows. In a clinical examination, allergy to cow dander was encountered in 42% of skin-tested farmers with hand eczema yielding a point prevalence of hand eczema with cow allergy of 1.6% for men and 4.7% for women in dairy farming (19). In a 12-year follow-up of the farmers with hand dermatosis in 1979, 50% of those still farming, both the men and the women, had hand dermatosis in 1991, while the corresponding percentage for those no longer farming was 30%.

It seems that allergy to cow dander, either immediate or delayed, is the main cause of hand dermatosis among dairy farmers. According to our studies, other occupational risks are irritant chemicals (disinfectants, silage preservatives) and allergens (rubber chemicals, fodder flours) (7).

Work-related respiratory diseases among Finnish farmers have been studied in the Kuopio Regional In-

stitute of Occupational Health since 1979 by three questionnaire surveys. In 1979 the prevalence of chronic bronchitis was 7.5 % for all farmers. Farmers working in swine confinement buildings had the highest prevalence (20). The incidence of chronic bronchitis was three times higher for farmers than for non-

Table 2. Causes of occupational diseases in agriculture in the years 1986–1990.^a (N = number of cases)

Cause	1986 (N)	1987 (N)	1988 (N)	1989 ^b (N)	1990 ^b (N)
Physical agents					
Cold temperature	2	6	3	..	..
Noise	20	39	55	50	54
Vibration	1	2	2	..	..
Repetitive movements	103	269	365	356	446
Abnormal mechanical pressure	40	41	21	66	..
Ultraviolet radiation	—	5	—	..	..
Chemical agents					
Herbicides	1	3	2	..	..
Animal dander	91	130	173	218	339
Flour dusts	14	20	32	..	47
Other organic dusts	1	4	3	..	..
Plants	2	—	—	..	..
Hydrogen sulfide	—	1	—	..	..
Formaldehyde	1	—	—	..	..
Isocyanates	—	1	—	..	..
Biological agents					
Viruses	13	3	8	..	..
Molds	206	236	325	195	120
Bacteria	1	3	—	..	..
Mites	1	—	6	..	..
Other	—	—	—	115	337
Unknown cause	—	2	1	..	..
Occupational dermatoses	128	161	210	232	248
Total	625	926	1206	1232	1591

^a Source: references 10–14.

^b The 1989 and 1990 registers report only the five most frequently occurring causes of occupational diseases in agriculture and the rest are reported under "other causes."

Table 3. Prevalence of health hazards among farmers as evaluated by occupational health service personnel in Finland in 1985.^a

Hazard	Men (N = 471) (%)	Women (N = 384) (%)
Noise (machinery)	94.7	24.2
Noise (animals)	8.5	7.3
Heat parameters	3.8	5.5
Lightning	7.9	12.0
Preservatives	23.8	9.4
Pesticides	54.6	13.5
Detergents and disinfectants	8.9	54.2
Dusts (feed, hay, bedding, animal dander and hair)	62.9	82.6
Other chemicals	19.3	23.4
Mold dust (hay, straw, wood chip)	7.6	12.0
Mold dust in common	28.9	39.1
Poor ergonomics in animal husbandry	41.8	57.6
Poor ergonomics in plant production work	26.5	5.0
Accidents	15.7	13.3

^a Source: reference 8.

farmers in a follow-up study based on the Finnish Twin Register, 1975—1981 (21). Chronic bronchitis occurred twice as often among nonsmoking, atopic farmers than among nonsmoking, nonatopic farmers (20). The prevalence of asthmatics was 3.3% (20), and symptoms of farmer's lung were found in 1.4%. About 14% of all of the farmers had symptoms of organic dust toxic syndrome in 1986 (22).

Work conditions of farmers. For about 50% of the farmers poor ergonomic work conditions are considered to be a health hazard (table 3). Almost every farmer is exposed to dusts that are considered health hazards. Noise and pesticides are a problem among the men. For the women detergents and disinfectants are also important health hazards.

Concluding remarks

Depending on the type of data being studied, the health of the farming population in Finland varies. The mortality of farmers is generally low, the only exception being mortality from respiratory diseases. The prevalence of self-reported morbidity was higher among the farmers than among the other socioeconomic groups studied. The most important work-related diseases among farmers were musculoskeletal disorders and respiratory diseases. Poor ergonomic work conditions and different kinds of dusts were the most commonly reported health hazards.

Occupational diseases among farmers are increasing. However, this tendency is probably not caused by a real increase in the occurrence of occupational diseases. The main cause is probably the effective occupational health service system which was introduced for Finnish farmers in 1985.

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