

McDuffie HH, Horne S. Family history of cancer as risk factor for non-Hodgkin's lymphoma, multiple myeloma and gliomas. *Am J Human Genetics*, 1990:47(3)A140 abstract 0545.

Senthilselvan A. Respiratory symptoms and alterations in pulmonary function tests in poultry producers: Results of a survey of farmers. *Am Rev Resp Dis* 1991 (suppl).

Senthilselvan A. Association between asthma and pesticides use in farmers. Surgeon General's Conference: Agricultural Safety and Health, Des Moines, Iowa. April 30 to May 3, 1991.

Teaching

We initiated a graduate class in Environmental epidemiology this year. Doctoral students are: Chen Zhou in Inhalation Toxicology correlating human and animal health with environmental assessments in swine confinement buildings and Donna Rennie in Environmental Epidemiology with a special interest in asthma among preschoolers. Dr. Yue Chen and Dr. Jan Zejda are post-doctoral fellows. Dr. Chen's research interests include male/female differences in response to cigarette smoke. Dr. Zejda is an occupational health physician who is coordinating the swine producers' study.

Two new faculty members joined us in September. Dr. Karen Semchuk is an epidemiologist who will be studying relationships between agricultural chemical exposures and chronic diseases, specifically neurodegenerative disorders. Dr. A. Senthilselvan, a biostatistician, is interested in morbidity and survival analyses.

Secretariate

Ruth Day, with the assistance of Celena Sabourin and Debbie Schiller, holds it all together.

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Drs. Helen McDuffie and Jim Dosman with letter from Hon. Perrin Beatty, Minister, Health and Welfare Canada, announcing grant of \$647,000 for the Cross-Canada Chemicals study.

CENTRE REPORT '90 - '91

ANNUAL REPORT AND SUMMARY OF ACTIVITIES

CENTRE FOR AGRICULTURAL MEDICINE, DEPARTMENT OF MEDICINE, COLLEGE OF MEDICINE, UNIVERSITY OF SASKATCHEWAN
Wing 3E, Royal University Hospital, Saskatoon, Saskatchewan, Sask.
S7N 0X0

FIFTH ANNUAL REPORT

May 1, 1990 to April 30, 1991



Dr. J. W. (George) Ivany (left), President, University of Saskatchewan, accepts the first contribution from industry to the Founding Chairs Program from Mr. Garf Stevenson, President, Saskatchewan Wheat Pool. Presentation took place at a press conference held at the Sheraton Cavalier Hotel, Saskatoon, October 12, 1990.

Chairman's Message

"The Centre for Agricultural Medicine Goes Public"

In previous Annual Reports I have summarized the organizational and scientific development of the Centre and discussed relationships with farm families through the Agriculture Health and Safety Network sponsored by individual Rural Municipalities.

To all of our supporters, I emphasize the importance that I personally place on the Founding Chairs Development Program of the Centre for Agricultural Medicine which was originally conceived by a committee led by Mr. M. Frederick Mitchell, President, Intercontinental Packers, and Mr. David Pitt, President, Massey-Ferguson. The Premier of the Province and the President of the University are Honorary Co-Chairs of the program. The purpose of the Founding Chairs Program is to establish an Endowment Fund aimed at transforming the Centre into a national and international centre of scientific leadership and activity in preventive medicine. The Founding Chairs Development Council seeks twenty individual companies, foundations, associations or groups of individuals to contribute \$25,000 per year for five years. I am happy to state that, as of the writing of this report, we are nearly midway in our objective and have passed the \$1 million mark in this exciting initiative.

In establishing the Founding Chairs Development Program, we seek both financial and moral support. Financially, it is our hope that the Founding Chairs Development Trust, when complete in 1996, will yield an annual interest dividend of approximately \$200,000 per year to supplement the support that is currently being provided by the University of Saskatchewan and by the Government of Saskatchewan. This source of funding is meant to complete the partnership between the University, Government of Saskatchewan, individual farmers, and the larger community.

The role of the University of Saskatchewan and the Saskatchewan Lung Association in establishing the Centre for Agricultural Medicine in 1986 is recognized. Commencement of core support from the Government of Saskatchewan in 1988 extended the partnership. Subsequently, support from the Saskatchewan Association of Rural Municipalities resulted in the formation of the Agricultural Health and Safety Network through which individual farm families are linked to the Centre for the purpose of support and prevention. The Founding Chairs Development Program and the long-term input from Founding Chairs contributors through the Founding Chairs Development Council prepares the way for our approach to senior levels of Government in our quest to establish a national base for the Centre.

An initiative such as the Founding Chairs Development Program cannot take place without the generous organizational and financial support of many individuals too numerous to mention in this report. However, I would particularly like to recognize the contribution of former University of Saskatchewan President, Leo Kristjanson, for his role in establishing the Centre for Agricultural Medicine and the Founding Chairs Development Program, and for his continued support. I would like also to welcome Dr. Walter Podiluk, former Deputy Minister of Health for Saskatchewan, who has taken on Directorship of the Founding Chairs Program so effectively. Most importantly, I would like to express my profound gratitude to those organizations and individuals who have contributed substantially to enable us to reach this important milestone, as well as to President Ivany and all the company presidents and others who are working so hard on our behalf.

Sincerely,

I. M. McDonald, Dean, College of Medicine,
Chairman, Board of Directors, Centre for Agricultural Medicine

Our Mandate

The Centre for Agricultural Medicine is continuing its goal-oriented program of research, prevention, service and teaching related to agriculture and related industries. Some, but not all of our activities are outlined below.

Research

Cross-Sectional Study of Respiratory Health in Swine Producers and Indoor Air Quality in Animal Confinement Buildings in Saskatchewan.

Workers in animal confinement barns in Saskatchewan may be at increased risk of developing lung trouble. The objectives of the study are to determine whether swine producers develop respiratory symptoms and lung trouble in excess of control subjects and to assess the role of indoor air quality in these buildings in the causation of lung trouble. (National Health Research Development Program).

Canadian Study of Pesticides and Health: This project includes a case-control study on 1,400 patients and 1,400 age-matched control subjects across Canada. The risk of cancers and other medical conditions in relation to pesticide exposure will be derived and the proportion of such cancers among males attributable to pesticide exposure will be estimated (National Health Research and Development Program).

Radon Exposure and Primary Lung Cancer in Females: In a large previous study, we found unexplained differences between men and women who developed primary lung cancer. Female cases developed lung cancer younger than men although we found (a) a higher proportion of lifetime non-smokers among women; (b) female patients who have smoked cigarettes began at an older age and smoked fewer cigarettes per day for fewer years. Exposure to alpha radiation derived from radon and radon progeny is a viable alternative hypothesis. If, in Saskatchewan, airborne radiation in homes constitutes a health risk, homes can be modified to reduce these exposures and thereby reduce the risk. (Saskatchewan Health Research Board, Saskatchewan Lung Association, Clinical Teaching and Research Fund).

Oral Contraceptive Use and Breast Cancer: Breast cancer incidence is increasing. Several of the known risk factors for breast cancer influence and interact with endogenous estrogen and other steroid hormones. It is possible that the stage at diagnosis of these tumours may have become altered since the introduction of "the Pill". This study abstracted and compiled stage at diagnosis data for women diagnosed between 1960 and 1987 (Saskatchewan Cancer Foundation).

Chemicals Exposure and Lymphomas in Females in Saskatchewan: Although an association between chemicals exposure and these types of tumours are thought to occur in males, there is no current information on females. This project is being conducted in Saskatchewan in order to test the hypothesis that women may be affected (Saskatchewan

Cancer Foundation, Clinical Teaching and Research Fund).

Experimental Study of the Respiratory Effects of Airborne Contaminants in Swine Confinement Buildings: The majority of swine confinement buildings are fully enclosed and concentrations of air contaminants such as feed-dust, ammonia and endotoxin are relatively high. Swine farmers with confinement building operations have increased respiratory symptoms and lower levels of lung function. The purpose of this study is to determine, in animal models, the nature of the structural changes and the mechanisms of the lung dysfunction caused by airborne particulate, aerosols and gases in swine confinement buildings (Agricultural Development Fund).

Effects of Agricultural Chemicals on Health and Initiation of Chemicals Safety Seminars: As exposure to farm chemicals may cause health problems, the Centre for Agricultural Medicine conducted a pilot study in Saskatchewan in order to further assess these risks. In addition, the Centre is conducting a seminar series aimed at safe handling of chemicals, including evaluations of the optimum methods of educating farmers and others (Saskatchewan Agriculture Development Fund).

Occupational Cancer Studies: The Occupational Cancer Studies Program of the Centre for Agricultural Medicine seeks to evaluate various substances, including agricultural chemicals, in the possible evolution of cancer in Saskatchewan residents. (Schulman Fund).

Prevalence of Prostate Cancer in Farmers: Existing evidence suggests that farmers are prone to increased prevalence of prostate cancer. Prostate cancer remains the most common cancer in Saskatchewan males after lung cancer (Seaton Family).

Development of Human Exposure Chamber for Health Assessment of Dusts and Chemicals: This will be the only human exposure chamber in Saskatchewan to assess health effects of dusts and chemicals from an occupational point of view. The establishment of this chamber will enable physicians and scientists to more accurately characterize substances to which workers are exposed, to assist in treatment and in Worker's compensation assessments (Saskatchewan Workers' Compensation Board).

Study of Incidence and Risk Factors Relating to Farm Accidents and Injuries in Saskatchewan: Farmers are more likely to sustain injuries and experience violent death as a result of their occupation than workers in any other major industry. Beginning in the summer of 1989, farm accident data is being collected by Saskatchewan Health and the Saskatchewan Safety Council in more than 200 hospitals in Saskatchewan. The Centre for Agricultural Medicine is currently analyzing these data.

Conferences

Second Annual Environmental Epidemiology Week, May 7-11, 1990: The aims and objectives of this event were a) to discuss and critique our research in progress or planned, and b) to provide access to expertise on

diverse topics which might lead to the formation of multidisciplinary research teams. The invited research faculty included Dr. Edgar Love, Epidemiologist, University of Calgary, Dr. Anita Myers, Psychologist, University of Waterloo and Dr. Thomas Sellars, Cancer Epidemiologist, University of Minnesota. Additional guest speakers included Dr. J. Docherty, Pharmacology, University of Saskatchewan, Mr. David Evans, Environmental Health Officer, Health and Welfare Canada, Mr. Andy Jansen, Agricultural Engineer, University of Saskatchewan, Mr. Murray Lengyel, Physical Therapist, Yorkton Union Hospital, Mr. Dennis Magnusson, Executive Director, Yorkton Union Hospital, Dr. Michael Reesal, Medical Health Officer, North Battleford Region, Mrs. Kathy Seaman, Director, Health Promotion Branch, Saskatchewan Health and Dr. H. V. Vachhrajani, Radiation Oncologist, Saskatoon Cancer Clinic.

Fifth Annual Conference on Cancer in Rural Areas - December 11, 1990: This year, the conference focus was new initiatives in cancer research in Saskatchewan. The invited speakers were Dr. S. Carlsen, Director of the recently established Cancer Research Centre of the Saskatchewan Cancer Foundation, Dr. Carol Haines, Director of the Louis Schulman Cancer Epidemiology Unit and Mrs. Diane Robson, Director of Data Management of the Saskatchewan Cancer Foundation.

Service

Occupational Health and Safety Services Division:

Health Maintenance Program in the Grain Industry: Elevator agents in Saskatchewan are at risk of developing respiratory dysfunction. In order to prevent development of illness and to promote a healthy lifestyle, these workers are given breathing tests and extensive private nursing counselling (Pioneer Grain Company, United Grain Growers, Parrish & Heimbecker, Paterson Grain Company, Cargill).

Lung Dysfunction in Pulp Mill Workers: As there is a possibility that workers in pulp mills are prone to the development of lung dysfunction, the Centre for Agricultural Medicine has begun a respiratory health maintenance program in association with Weyerhaeuser Pulpmill at Prince Albert (Weyerhaeuser Canada).

Agricultural Health and Safety Network: Resident farm families in 30 rural municipalities are now enrolled in the Network. The Centre continues to provide respiratory health surveys and educational materials to the members. This year a pilot noise-induced hearing loss survey was conducted by Mrs. Louise Hagel and Dr. Michael Reesal. This survey led to the production of the first fact sheet designed by the Centre. The co-operation of members in two RM's proved valuable in conducting a pilot study of stress and stress-related problems in rural areas. A new initiative based in the Yorkton Union Hospital and offered to surrounding RM's may be the prototype of the future. Respiratory health screening and other preventive health measures are offered to members of the Network through the co-

operation of the hospital, Rural Municipalities, the Centre, and other local organizations including the Yorkton Rural Health Region, Rotary Club and ACT Club.

Labour Canada Grain Dust Medical Surveillance Program Statistical Contract: Grainworkers across Canada are included in this program and the Centre continues to manage the statistical medical information base and ongoing surveillance project.

Seminar for Public Health Nurses on Agriculture-Related Health Risks: Centre staff and faculty co-operated in providing state-of-the-art information to practicing public health nurses. This is an area in which we will expand in future.

Publications

Papers

McDuffie HH. Atopy and adenocarcinoma of the lung in females. *Chest* 1991; 99:404-407.

McDuffie HH, Klaassen DJ, Dosman JA. Is pesticide use related to primary lung cancer in Saskatchewan? *Journal of Occupational Medicine* 32:996-1002, 1990.

Horne SL, Cockcroft DW, Dosman JA. A possible protective effect against chronic obstructive airways disease by the GC 2 Allele. *Human Heredity* 40:173-176, 1990.

McDuffie HH, Klaassen DJ, Dosman JA. Determinants of cell type in patients with cancer of the lungs. *Chest* 1990;98(5):1187-1193.

Bigsby RM, Li A, Luo K, Cunha GR. Strain differences in the ontogeny of estrogen receptors in murine uterine epithelium. *Endocrinology*, 1990; 126(5):2592-2596.

McDuffie HH. Clustering of cancer in families of patients with primary lung cancer. *J of Clinical Epidemiology*, 1991; 44(1):69-76.

Zejda J, Hagel L, McDuffie HH, Dosman JA. Respiratory occupational medicine and the practicing physician. *Saskatchewan Medical Journal* 1991:2:8-10.

Chen Y, Horne SL, Dosman JA. Increased susceptibility to lung dysfunction in female smokers. *Am Rev Resp Dis*, 143(5), 1991.

Zejda J, Dosman JA, Gomez SR, Rhodes C, Barber E, McDuffie HH. Respiratory symptoms and lung function in swine producers in Saskatchewan: Proceedings of the American Association of Swine Practitioners Annual Meeting, Minneapolis, March 3-5, 1991. pp. 395-407.

Semchuk KM, Love EJ, Lee RG. Parkinson's disease and exposure to rural environmental factors: a population based case-control study. *The Canadian Journal of Neurological Sciences* (in press).

Barber RM, Rhodes CS, Dosman JA. Improving air quality in pig buildings. Proceedings of the American Association of Swine Practitioners Annual Meeting, Minneapolis, March 3-5, 1991, pp 409-424.

Technical Reports:

Gomez S, Zejda J, Hurst T, Dosman JA, Rhodes C, Barber E, McDuffie HH. Cross-sectional study of respiratory health in swine producers and indoor air quality in animal confinement buildings in Saskatchewan.

Interim report to Health and Welfare Canada, August, 1990.

Selected Invited Presentations:

Semchuk KM. Parkinson's disease and exposure to rural occupational and environmental factors. 1991 Annual Meeting of the Parkinson's Society of Southern Alberta, Calgary, Alberta, April 15, 1991.

Semchuk KM. Parkinson's disease and exposure to occupational and environmental factors associated with rural living: a population based case-control study. Department of Community Health Sciences, Faculty of Medicine, the University of Calgary, Calgary, Alberta, April 15, 1991.

Dr. Chen Zhou: Invited speaker at Plenary Session: "Occupational Lung Diseases in the Industrializing and Industrialized World: Commonalities and Contrasts." ATS/IUATLD World Conference on Lung Disease, Boston, May, 1990. Topic: Occupational Lung Diseases (silicosis) in China.

Dr. Jan Zejda: Invited participant at Canada's Green Plan Conference, Ottawa, 1990: Workshop on Agriculture.

Abstracts and Scientific Presentations:

Zejda J, Olenchock SA, Gomez S, Barber E, Rhodes C, McDuffie HH, Dosman JA. Concentration of airborne endotoxin and lung function in swine producers. *Am Rev Resp Dis*, 1991 (suppl). 143:A99

Gomez S, Zejda J, Rhodes C, Barber E, Hurst T, McDuffie HH, Dosman JA. Respiratory health in swine producers in Saskatchewan. *Am Rev Resp Dis* 1991 (suppl). 143:A439

Dosman JA, Zejda J. Health and safety risks in agriculture. Proceedings of the Western Swine Practitioners Association Meeting, Saskatoon, October, 1990.

Chen Y. Synergistic effect of passive smoking and artificial feeding on hospitalization for respiratory illness in early childhood. *Pediatrics Digest* 1990; 1:14-15.

Chen Y, Horne SL, Dosman JA. Increased susceptibility to lung dysfunction in female smokers. *Clin Invest Med* 1990; 13(4):suppl B123. Presented at the Royal College of Physicians and Surgeons Annual Meeting, Toronto, September 14, 1990.

Horne SL, Chen Y, Cockcroft DW, Dosman JA. Pulmonary function associated with number of children in Pi MZ but not Pi M women. *Am J Hum Gen* 1990; 47 (suppl):A138. Presented American Society of Human Genetics, May, 1990.

Zhou C, D.W. Cockcroft, T. Hurst, J.A. Dosman: Increase of airway hyperresponsiveness in swine farmers. ATS/IUATLD World Conference on Lung Disease, Boston, May, 1990.

Zhou C, Zhielj Lou: The comparison of chest X-rays and lung function in jute workers. 23rd International Conference in Occupational Health. Montreal, September 23, 1990

Zhou C, A. Senthilselvan, P. Pahwa, D. Hall, H.H. McDuffie, J.A. Dosman: Airway responsiveness and atopy as determinants of longitudinal lung function change in new grain workers. *Am Rev Resp Dis*, 1991 (suppl). 143:A439

Zhou C, R. Mueller, E. Barber, C. Rhodes, T. Hurst, J.A. Dosman: Shift change of lung function in swine farmers. *Am Rev Resp Dis*, 1990:141(4) suppl A591.

Pahwa P, McDuffie HH, Dosman JA. Effect of dust exposure on pulmonary function of grain handlers surveyed cross-sectionally. Presented at 1990 World Conference on Lung Health, Boston, May, 1990. *Am Rev Resp Dis*, 1990; 141(4), suppl A591.

Zhou C, Hurst TS, Cockcroft DW, Dosman JA. Increase in airway hyperresponsiveness in swine farmers. Presented at 1990 World Conference on Lung Disease, Boston, May, 1990. *Am Rev Resp Dis* 141:A591, 1990.

McDuffie HH, Pahwa P, Cotton DJ, Graham BL, Dosman JA. Skin test atopy as determinant of job decision making in workers exposed to grain dust. Presented at 1990 World Conference on Lung Health, Boston, May, 1990. *Am Rev Resp Dis* 141: A77, 1990.

Gomez SR, Parker RA, McDuffie HH, Dosman JA, Kanja J, Kirychuk S. Respiratory health effects of blowing alkali dust on a southern Saskatchewan community. Presented at 1990 World Conference on Lung Health, Boston, May, 1990. *Am Rev Resp Dis* 141; A77, 1990.

McDuffie HH, Pahwa P, Dosman JA. Respiratory health status of 3,098 grain workers in Canada studied on two occasions three years apart. Presented at 23rd International Congress on Occupational Health, Montreal, September, 1990.

Dosman JA, McDuffie HH, Pahwa P. Skin test atopy as determinant of job decision making in workers exposed to grain dust. Presented at 23rd International Congress on Occupational Health, Montreal, September, 1990.

Pahwa P, McDuffie HH, Zasada M, McNeill G, Dosman JA. Farm accidents in Saskatchewan. Presented at 23rd International Congress on Occupational Health, Montreal, September, 1990.

Senthilselvan A, Dosman JA, Pahwa P. Respiratory symptoms and alterations in pulmonary function tests in poultry producers: Results of a survey of farmers. *Am Rev Resp Dis* 1991 (suppl). 143:A100

Zhou C, Muller R, Barber E, Rhodes C, Hurst T, McDuffie HH, Dosman JA. Shift changes in lung function in swine farmers. *Am Rev Resp Dis* 1991 (suppl). 143:A439

Dosman JA, Pahwa P, McDuffie HH. Longitudinal observations in grain workers in Canada. *Am Rev Resp Dis* 1991 (suppl). 143:A99

White D, McDuffie HH, Pahwa P, Gomez S, Parker R, Dosman JA. Rural residence: A risk factor for non-Hodgkin's lymphoma in women? Proceedings of American Society of Clinical Oncology Annual Meeting, Houston, 1991.

McDuffie HH. Age related characteristics of primary lung cancer patients in Saskatchewan, Canada. Invited summary. *Respiratory Diseases Digest*, 1990.

McDuffie HH. Cancer in families of patients with non-Hodgkin's lymphoma. Presented Genetics Society of America, Genetics Society of Canada Joint Meeting, July, 1990. *Genetics Society of Canada Bulletin, Suppl* 1990; 21:49 abstract 1.113.